

Just for your
RS-80® COLOR
TDP System 100
Dragon & MC-10

November 1984

Canada \$4.95

U.K. 13.95

\$3.95

RAINBOW

THE COLOR COMPUTER MONTHLY MAGAZINE

TELECOMPUTING

Our 'Reach Out' Issue

A Complete Smart Terminal Program

A Comprehensive CoCo BBS List

Auto Answer for your Modem 1

And, Rainboard '84

ALSO

Road Racing

Ham Radio and CoCo

An OS-9 Device Driver

An Easy Line-lister

Jumbo Jinfile and Junk Food, too

With

Dale Puckett, Roger Schrag, Colin J. Stearman, Fred Scerbo, Dan Downard, Ramon Zamora, R. Wayne Day, Joseph Kolar and dozens of other Rainbow writers



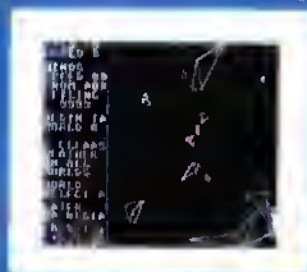
44254 00001

COMPUTERWARE
CATALOG INSIDE!

New From Tom Mix

Worlds of FLIGHT

Not A Game — A Very Realistic Flight Simulation



WORLDS OF FLIGHT (WOF) is a "view" oriented flight simulation for the TRS-80 Color Computer, written entirely in Machine Language. "View" oriented means that the pilot may determine his or her position by actually viewing the surrounding landmarks as opposed to using instruments which sense navigational references. This is a major departure from "instrument only" simulations which can be achieved through BASIC programs. Most instrument maneuvers and procedures may be practiced. The craft is a light-weight, single-engine airplane with low wings. A nose wheel which is both steerable and retractable is also modeled. Some aerobatics are possible including sustained inverted flight, aileron rolls, spins and stalls.



The Experts Say:

C.L. — "As a pilot I found "Flight" to be an outstanding simulation.

M.H. — "No one has created a more realistic flight simulator for the Color Computer."

D. HOOPER, pilot for major airline —
"An outstanding flying experience. Very realistic."



TOM MIX SOFTWARE

4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

•ADD \$1.50 POSTAGE & HANDLING•TOP ROYALTIES PAID•
•MICHIGAN RESIDENTS ADD 4% SALES TAX•
LOOKING FOR NEW SOFTWARE



ARCADE ACTION GAMES

TO ORDER CALL 616/957-0444

VISA

From Computer Plus to YOU...

PLUS after PLUS after PLUS



Model 100 8K \$495
Model 100 24K \$625



Color Computer II
w/16K Ext. Basic \$135
w/64K Ext. Basic \$195



Model 4 16K \$629
Model 4 64K
2 Disk & RS232 \$1020



DMP120 \$385



Color Computer Disk Drive
Drive 0 \$289 Drive 1 \$220



DWP210 \$489
DWP510 \$1295

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS

Model 4 Portable	
64K w/2 Drives	1020
Model 2000 2Dr	2299
Model 12 1 Drive	2360
Model 16B 1Dr 256K	3965

MODEMS

Hayes Smartmodem II	215
AC-3	125
DC Modem I	89
DC Modem II	160
DC Modem 2212	315

PRINTERS

Silver Reed EXP500 D.W. Par.	365
Silver Reed EXP550 D.W. Ser.	430
CGP115	159
CGP220 Ink Jet	545
DMP110	299
Gemini 10X	265
Gemini Powertype	345
Panasonic P1091	315
Smith Corona Fastext	190
Prowriter B510	345
Okidata and Epson	CALL

ETC.

Disk Drive Controller	139
Extended Basic Kit	39.95
PBH Ser/Par Conv.	69
64K Ram Chips	62.95
Deluxe Keyboard	35.95
HJL Keyboard	79.95
CCR-81 Recorder	52
Deluxe Joystick (each)	35.95
Joysticks (pair)	22
Video Plus (monitor adapter)	24.95
Video Plus IIC	39.95
Amdek Color 1+ Monitor	299
Amdek Video 300 Green	145
Amdek Video 300 Amber	159
Taxan Color 210 Monitor	235
Taxan Green	125
Taxan Amber	129

SOFTWARE

(Tape Version)	
The King	26.95
Screen Print (specify printer)	19.95
Buzzard Ball	27.95
World of Flight	29.95
Colorpede	29.95

Juniors Revenge	28.95
Pac Attack	24.95
Block Head	26.95
Lunar Rover Patrol	24.95
Lancer	24.95
Typing Tutor	23.95
Galagon	24.95
Scott Adams Adventures	19.95
Sea Dragon	34.95
Colorcome	49.95
Telewriter 64	49.95
O-Pak (disk)	34.95
Key-264K	39.95
Draft Pascal	79.95
Elite-Calc	59.95
VIP Writer	69.95
VIP Calc	69.95
VIP Terminal	49.95
VIP Database (disk)	59.95
Graphicom	29.95

Order any 2 software places listed and take 10% off their listed price. All Radio Shack software 10% off list. Send for complete list.

CALL TOLL FREE
1-800-343-8124

- LOWEST POSSIBLE PRICES
- BEST POSSIBLE WARRANTY
- KNOWLEDGEABLE SALES STAFF
- TIMELY DELIVERY
- SHOPPING CONVENIENCE



computer
plus

P.O. Box 1094
480 King Street
Littleton, MA 01460

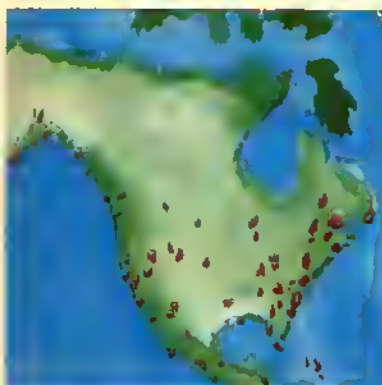
SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

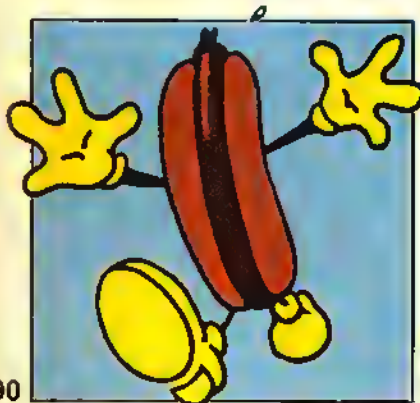
Under The RAINBOW

FEATURES

50



90



177



COVER art © by Fred Crawford

NEXT MONTH: December is our ho, ho, holiday issue filled with programs and articles to make your season bright, including Christmas carols, Christmas graphics, Christmas and Hanuka cards, and much more.

We'll also announce the winners of our Second Annual RAINBOW Adventure Contest and include one or two of the finest entries.

As always, there will be a mix of articles, departments and product reviews just for CoCo — more information than is available anywhere! Happy Holidays!

Adding An Auto Answer/Tony Sharp	18
DATA COMMUNICATIONS <i>Building a circuit for the TRS-80 Modem I</i>	
EZ List/Michael Davidson	23
UTILITY <i>A simpler way to list lines one at a time</i>	
File It With The Message Center/Jim Schmidt	28
COMMUNICATIONS <i>Bulletin board for your home</i>	
Road Race/Shane Franklin	36
GAME <i>Start your engines</i>	
RAINBOARD 1984/Lane Lester Ph.D.	44
DATA COMMUNICATIONS <i>An update on last year's BBS</i>	
CC-Talk — A Smart Terminal Package/Frank Gossette	50
DATA COMMUNICATIONS <i>Begin exploring telecomputing</i>	
BBS Wrap-Up/R. Wayne Day	66
DATA COMMUNICATIONS <i>A comprehensive listing of bulletin board systems</i>	
RS-232 Interface Cable For DCE/Helene M. LaBonville	89
DATA COMMUNICATIONS <i>Make your own cable connection</i>	
Junk Food/D. Taylor	90
GAME <i>Be a 'chomption'</i>	
The Diskette Directories Handler System/Marvin E. Swan	100
DISK UTILITY <i>An easy, efficient diskette file organization</i>	
CLOAD Command Fixer/Curt Chadwick	116
TAPE UTILITY <i>Finding the end of that file</i>	
Home Financial Management/Edward W. Carson	132
FINANCE <i>A personal savings and loan calculation program</i>	
A Special Use For The DOS Command/Roger Schrag	140
DISK UTILITY <i>Make your disk system more useful</i>	
Cooking With CoCo/Colin J. Stearman	146
EXPANDING BASIC <i>Part V, adding code to new commands</i>	
Everything To Know About CoCo/Andy Kluck	157
TUTORIAL <i>The peculiarities of Disk BASIC</i>	
JINFILE — A Jumbo File Handler/Robert Weir	162
UTILITY <i>A special purpose filing program</i>	
Developing A Database Manager/Bill Nolan	245
DISK TUTORIAL <i>The use of direct disk access</i>	
Ham Radios And CoCo/Dan Downard	250
COMMUNICATIONS <i>CoCo's uses in communications</i>	
OS-9 Device Driver/Siege Den Beste	259
OS-9 UTILITY <i>Using the RS-232 Pak with OS-9</i>	

COLUMNS

BASIC Training/Joseph Kolar _____	151
<i>Simple Programs: A learning experience for all</i>	
Bits And Bytes Of BASIC/Richard White _____	126
<i>Rainbow checkbook II</i>	
Building November's Rainbow/Jim Reed _____	16
<i>Thoughts on telecomputing</i>	
CommLink/R. Wayne Day _____	72
<i>Modeming across America</i>	
Earth To Ed/Ed Ellers _____	190
<i>Beam up those "tech" questions</i>	
Education Notes/Steve Blyn _____	254
<i>Using guide words</i>	
Education Overview/Michael Plog, Ph.D. _____	252
<i>The 'system' and its important procedures</i>	
Game Master's Apprentice/George Firedrake and Art Canfil _____	120
<i>Playing the game of Heroic Fantasy</i>	
Print#-2/Lawrence C. Falk _____	12
<i>Editor's notes</i>	
School Is In The Heart Of A Child/Bob Albrecht and Ramon Zamora _____	81
<i>'Guess my word' game</i>	
Turn Of The Screw/Tony DiStefano _____	130
<i>Forcing a hardware cold start</i>	
Wishing Well/Fred Scerbo _____	177
<i>It's time for football fever</i>	
R. Bartley Betts' "Byte Master" will return next month.	

RAINBOWTECH

Downloads/Dan Downard _____	268
<i>Answers to your technical questions</i>	
Personable Pascal/Daniel A. Eastham _____	271
<i>Procedures and functions</i>	
KISSable OS-9/Dale L. Puckett _____	280
<i>Transportation to hacker heaven and two useful routines</i>	

DEPARTMENTS

Advertiser Index _____	288	Reviewing Reviews _____	198
Back Issue Information _____	269	Scoreboard _____	186
Corrections _____	244	Scoreboard Pointers _____	188
Letters To Rainbow _____	6	Submitting Material _____	
The Pipeline _____	136	To Rainbow _____	115
Received And Certified _____	195	Subscription Information _____	115
		These Fine Stores _____	286

PRODUCT REVIEWS

Product Review Contents _____	193
--------------------------------------	------------

RAINBOW

November 1984 Vol. IV No. 4

Editor and Publisher

Lawrence C. Falk

Managing Editor James E. Reed

Senior Editor Courtney Noe

Technical Editor Dan Downard

Copy Editor Susan Remini

Submissions Editor Jutta Kapfhammer

Reviews Editor Monica Dorih

Editorial Assistants Valerie Edwards,

Wendy Falk, Suzanne Benish Kurowsky,

Greta Martin-Eneje, Lynn Miller, Shirley Morgan

Kevin Nickols, Tamara Solley

Technical Assistant Ed Ellers

Contributing Editors Bob Albrecht, R. Bartley Betts

Steve Blyn, R. Wayne Day, Tony DiStefano,

Dan Eastham, Frank Hogg, Don Inman,

Joseph Kolar, Michael Plog, Dale Puckett,

Fran Saito, Paul Searby, Fred Scerbo,

Richard White

Art Director Sally Gellhaus

Assistant Art Director Jerry McKiernan

Designers Peggy Henry, Neal C. Lauron,

Kevin Ouggins

Advertising Coordinator Charlotte Ford

Advertising Representative Kate Tucci

Advertising Assistant Debbie Baxter

(502) 228-4492

General Manager Patricia H. Hirsch

Asst. General Manager for Finance Donna Shuck

Bookkeeper Diane Moore

Advertising Accounts Doris Taylor

Dealer Accounts Judy Quashnock

Administrative Assistant to the Publisher

Marianne Boolh

RAINBOWest Site Management Willo Falk

Director of Fulfillment Services Bonnie Shepard

Asst. Customer Service Manager Deidra Henry

Customer Service Representative Sandy Apple

Word Processor Manager Lynda Wilson

RAINBOW ON TAPE Subscriptions Monica Wheat

Research Assistants Laurie Falk,

Debbie Leake, Lorella Varda

Dispatch Janice Eastburn

Production Assistant Melba Smith

Advertising and Marketing Office for the Western states and provinces: Cindy Shackelford, director, 12110 Meridian South, Suite 8, P.O. Box 73-578, Puyallup, WA 98373-0578. Phone: (206) 848-7768. Territories included: AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY, Canadian Provinces of Alberta, British Columbia, Saskatchewan.

THE RAINBOW is represented in the Eastern United States by Gentland Associates, Inc., P.O. Box 314, S.H.S., Duxbury, MA 02331. (617) 934-6464 or 934-6546. Advertisers east of the Mississippi may contact them for further information. Territories included: AL, CT, DE, DC, FL, GA, IL, IN, KY, ME, MD, MA, MI, MS, NC, NH, NJ, NY, OH, PA, RI, SC, TN, VA, VT, WV, WI, Canadian Provinces of Ontario, Quebec.

THE RAINBOW is published every month of the year by FALSOFT, Inc., 8529 U.S. Highway 42, P.O. Box 385, Prospect, KY, 40059. Phone (502) 228-4492. THE RAINBOW and THE RAINBOW logos are ® trademarks of FALSOFT, Inc.

Second class postage paid Prospect, KY and additional offices. USPS N. 705-050 (ISSN No. 0746-4797). POSTMASTER: Send address changes to THE RAINBOW, P.O. Box 385, Prospect, KY 40059. Forwarding Postage Guaranteed. Authorized as second class postage paid from Hamilton, Ontario by Canada Post, Ottawa, Ontario, Canada.

Entire contents © by FALSOFT, Inc., 1984. THE RAINBOW is intended for the private use and pleasure of its subscribers and purchasers and reproduction by any means is prohibited. Use of information herein is for the single end use of purchasers and any other use is expressly prohibited. All programs herein are distributed in an "as is" basis, without warranty of any kind whatsoever.

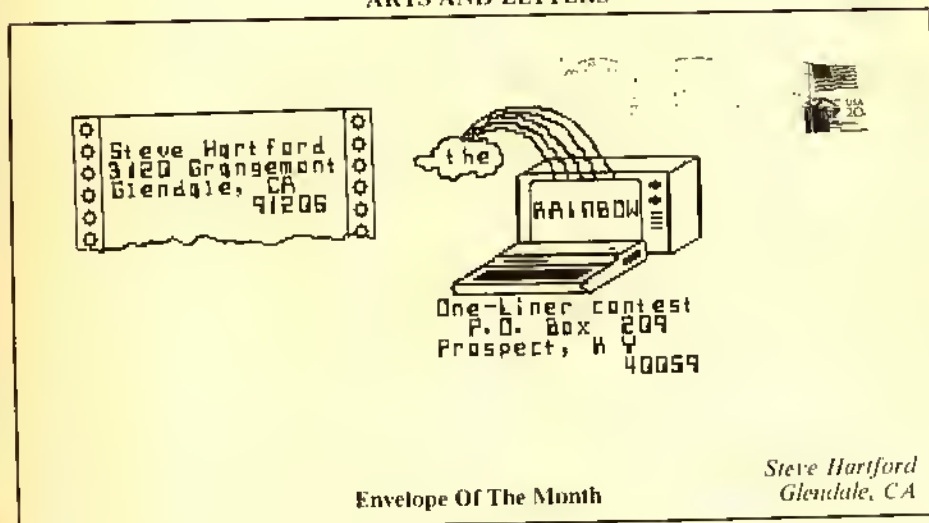
TRS-80, Color BASIC, Extended Color BASIC, Scriptit and Program Pak are ® trademarks of the Tandy Corp. CompuServe is a ® trademark of CompuServe Inc.

Subscriptions to THE RAINBOW are \$28 per year in the United States. Canadian and Mexican rates are U.S. \$35. Surface mail to other countries is U.S. \$65, air mail U.S. \$100. All subscriptions begin with next available issue.

Limited back issues are available. Please see notice for issues which are in print and costs. Payment accepted by VISA, MasterCard, American Express, Cash, Check or Money Order in U.S. currency only.

LETTERS TO THE RAINBOW

ARTS AND LETTERS



Envelope Of The Month

Steve Hartford
Glendale, CA

Editor:

I would like to know of any agricultural software for my CoCo 2. I have looked in Radio Shack's Agricultural Software Book without luck.

My address is: 417 N. Jackson, 39470.

Domitric Tynes
Poplarville, MS

Editor:

Could you tell me where I can write to and obtain a program that will allow me to transfer my machine language programs from tape to disk, even if I don't know the beginning and ending address.

William Borowicz
Troy, MI

Editor's Note: Try *Limousine Utility* by Roger Schrag on Page 48 in the January 1984 RAINBOW.

Editor's Note: Please see the "one-liners" sprinkled throughout this issue of THE RAINBOW. Submit your favorite one-liner too.

INFORMATION PLEASE

Editor:

I have a TRS-80 Color Computer 2 16K ECB and have been trying to find the POKE command to make my computer not list a program.

I would appreciate it if you could send me this command. I believe I saw it printed somewhere in one of your mailers but I have misplaced it.

J. Chris Carter
Troy, NC

Editor's Note: If you would like to keep your program from listing, use POKE383,158. To return to normal listing, type POKE383,0.

Editor:

I have been involved with an organization for single parents, Parents Without Partners.

I thought it might be interesting to have a computer date-matching program that I could bring to meetings or parties. It would be desirable for several people to answer a series of questions and then be able to see how closely matched some may be.

So, if possible, I would like to see a date matching program in a future issue of THE RAINBOW. I'm sure it would be of interest to many.

Peter Tillman
Franksville, WI

Editor's Note: You may be interested in "What Is Your Compatibility Rating?" which appeared on Page 292 in the February 1983 issue of THE RAINBOW.

CARTOON MAKER

Editor:

Whn makes and sells computers and graphics printers for animating cartoons?

For special effects, cartoons are used with excellent colored graphics, 24 frames per second. For our cartoon we need 90,000 graphics.

Dieter Klose
Rio de Janeiro, Brazil

Editor's Note: There is a new product by Triad Pictures Corp. called *The Animator* that might help you. Check this month's "Received & Certified" for details.

Editor:

I have recently purchased Radio Shack's Hi-Res screen print utilities Cat. No. 26-3121, for the 16K CoCo.

I have had trouble loading this into in 64K CoCo with extended BASIC. In the book

supplied with the screen print, it says to type **CLEAR 200,12288** and **ENTER**. Then **CLOADM "PROGRAM"**, (**50688+NEW ADDRESS**) to reset the default address. This has not worked and shows an FC Error. Can you tell me how I may load this program into my machine?

Richard Higley
Whittier, CA

Editor's Note: Try **CLEAR 200, 31232:CLOADM "BWDUMP"**, 16 384.

MORE CHARACTER

Editor:

I have a 6809 chip with 32K RAM. This uses one-fourth of the normal screen display or 32-character wide. How can I make it 64-characters wide and 32 lines down?

H.A. McAlhany
Anderson, IN

Editor's Note: The 6847 video generator in the CoCo is designed for the 32-column display only. Some driver programs are available to give wider displays.

Editor:

I will be a student at North Marion High School and will be enrolled in two algebra classes, Algebra 1 and Algebra 2. I have looked over THE RAINBOW many times to find programs that will help me in these classes. I would like to know if there are any programs that will help me. I have a 64K Extended Color BASIC Color Computer with cassette and printer. Please send suggestions to: Rt. 3, Box 55, 26582.

Dennis McKinney
Mannington, WV

Editor:

Does anyone have issues July 1982 through January 1983 (Vol. 2, Nos. 1 through 7)?

Please send the issue number and price desired to: 29 Cook Avenue, 14701.

Keep up the good work on a great magazine.

Leon C. Wilson
Jamestown, NY

Editor:

I need a veterinary office management system for the CoCo. Ideally, it would store/index drug information, bill patients and record office visits, but any applicable program is appreciated. Please write: #1 Peterson Court, 62626.

Deanne I. Vermillion
Carlinville, IL

HINTS & TIPS

Editor:

The following statement will transfer your disk directory to any printer.

POKE 111,254:DIR

Note: You must use the colon!

Paul MacArthur
Gillette, WI

Editor:

I have come across a poke statement which I think if you publish may be very helpful to anybody who has a database with a security code.

The following statement disables a 16K CoCo's keyboard:

POKE 169,0

Kenny Lee
Niagara Falls, NY

Editor:

I would like to pass on a tip that I think is very helpful for people calling bulletin boards. Have your tape recorder connected to the phone line when you call. You can have a record of the conversation.

Then after you are through calling, you can play the tape back into the modem. You can pick out the things you might have missed, or could not get into your buffer.

Thomas Bailey
Fredericktown, MO

COLORS GALORE

Editor:

I have heard much about overlaying **PMODE 3** and **4** to obtain more colors. In **PMODE 4**, however, I have found a way to use four colors very easily:

POKE 178,0	BLACK
POKE 178,1	BLUE
POKE 178,2	ORANGE
POKE 178,3	WHITE

(This is with **SCREEN 1.1** — other colors appear with **SCREEN 1.0**.)

Pokes to 178 with a higher value than three create multicolored patterns (using all eight colors) that are very useful before a **PAINT** or **LINE**, etc.

Mark Charney
Deenville, NJ

Editor:

Here's a twist on *The Simplicity of Sine-lines* which appeared in your Oct. 1983 issue, Page 80. Using the **178 POKE**, this really adds the "Jackson Pollock" effect. Make these changes:

Add Line 30 **POKE 178,RND(255)**
Change Line 150 **GOTO 30**

Paul Feldman
Wayne, NJ

Editor:

I would like to bring to the attention of Disk Extended BASIC users that it is possible to use a **FOR/NEXT** loop to **FIELD** a direct access file buffer.

For example, to create 16 fields of four bytes each, one can use the standard syntax which results in a lot of typing or do the same task by using the following line:

NNN FOR I=1 TO 16:FIELD#1,1-4 AS DS,4 AS V(I):NEXT

The **DS** variable is a dummy whose purpose is only to move the pointer in the buffer to the correct position. Unequal field lengths can easily be managed if the size of each field is put in an array. I hope that this informa-

NEW SOFTWARE PACKAGES

Two new disk utilities for The Color Computer

Free Book worth \$14.95 with each order. See offer below!

DMAGIC

Several menu driven aids to keep your disks clean & tidy

- Copy, load, rename and delete files as you step thru the disk directory with single keystroke commands. No more frustrating file name spelling errors!
- Page feature displays 26 directory files at a time. No more dir "fly-by."
- Sort directory and store on disk in alphabetical order.
- Find machine language start/end/execution addresses.
- For single or multiple drives.
- R.S. color DOS—16k minimum required.
- Supplied on disk—**\$19.95**

PRO-LOC

Control access to sensitive programs and files.

- The PRO-LOC loader allows programs to be saved to disk in a password protection mode. The program will not load or run unless proper password supplied.
- Data and text files can also be "locked" with PRO-LOC.
- Easy to use—menu driven commands.
- R.S. color DOS with 16k minimum required.
- Supplied on disk—**\$19.95.**

FREE with each order—
THE POWER OF THE TRS-80 COLOR COMPUTER. This illustrated book is compiled with 29 NEW programs for fun and education. A guide to programming the full range of color computer capabilities, it helps users write intelligent and well thought out programs. **Regular price \$14.95.**

We accept Master Card, VISA, check or money order.

Original color computer software wanted. High royalties paid.

Please send me:

___ **DMAGIC @ \$19.95**
___ **PRO-LOC @ \$19.95**



Add 5% sales tax if a resident of Massachusetts

TOTAL

NAME

ADDRESS

CREDIT CARD

CREDIT CARD NUMBER

EXPIRATION DATE

DORISON HOUSE PUBLISHERS, INC.
824 Park Square Building
Boston, Massachusetts 02116

tion may be useful to some of your readers.

I would like to know what to do to hook an IDS Prism Printer to my Computer (that printer has both serial and parallel capabilities).

THE RAINBOW is the source of information for CC owners and I keep reading it with great interest.

Daniel Paradis
Fleurimont, Quebec

COCO GETS CHECKERED FLAG

Editor:

CoCo wins the Pocono 500! The winner of the Pocono 500, Danny Sullivan, and his pit crew used a CoCo I (silver) to help manage his fuel and passed Rick Mears and Bobby Rahal with only a few laps to go to win the race. Even old CoCos are great!

Jon Alchin
Lompoc, CA

BOUQUETS

Editor:

I just have to let you know about one of your advertisers. A few weeks back I ordered a CoCo Cooler from REM Industries. Well, it came and I installed it per the enclosed instructions and the cooler ran very hot. Concerned about this, I called REM and was advised this running hot was not a nor-

mal condition for the cooler. The gentleman that answered the phone advised me to send the unit back and it would be replaced, as it was guaranteed.

I am pleased to say I am using the new CoCo Cooler now and it is working beautifully. Also, I received a note from Richard at REM asking me to accept the keyboard cover enclosed with the cooler for my inconvenience with the first unit. That's very nice and beyond ordinary customer service, and REM Industries will remain tops on my list of suppliers of equipment for my CoCo.

R.C. Hughes
Waxahatchie, TX

Editor:

A rare event compels me to take keyboard in hand to sing the praises of one of your advertisers and columnists. I am referring to Daniel Adams Eastham, president of DEFT Systems, Inc. and writer of your new "Personable PASCAL" column.

As a satisfied owner of DEFT PASCAL Workbench and enthusiastic reader of "Personable PASCAL," I had occasion to write a letter recently to Mr. Eastham in which I inquired about a situation that occurs when running one of the workbench programs. Four days after mailing the letter I received a return response which contained not only the answers to my questions, but also a diskette with the latest versions of the workbench programs — FREE OF CHARGE! I believe this kind of service and concern for customer satisfaction from a software ver-

dor is rare indeed, and worthy of praise and recognition.

On top of this is the fact that the DEFT PASCAL Workbench programs are absolutely first rate software which I heartily recommend to anyone who wishes to work with the PASCAL language on the CoCo without the need for OS-9, FLEX, or any other such operating system. My congratulations and thanks to both Mr. Eastham and THE RAINBOW for maintaining such high standards.

Wes Johnson
Leominster, MA

MAKIN' MUSIC

Editor:

Ever since I typed in *Music+* from the June 1984 issue of THE RAINBOW [Page 74], I have typed in song after song from church hymnals, piano sheet music and borrowed music books. I was impressed by the difference between *SOUND* and *PLAY* but I was overwhelmed by the CoCo's four-part harmony capability.

I would like to ask THE RAINBOW readers who have computerized any of their favorite songs, if they would like to trade binary music programs by tape or disk. I have several disks of music programs like *Star Wars*, *Nadia's Theme*, *Dr. Zhivago*, or *The William Tell Overture*. This offer is also open to the readers who use *Composer* (THE RAIN-

THE BOOK THAT CAN LAUNCH A 1000 PROGRAMS 500 POKES PEEKS 'N EXECS FOR THE TRS-80 COLOR COMPUTER

NEVER BEFORE has this information of vital significance to a programmer been so readily available to everyone. It will help you develop your own HI-QUALITY Basic and ML programs. SO WHY WAIT??

This Book includes 80 pages of information on almost ALL POKE, PEEK and EXEC commands with full explanation and comments on the use of EACH command.

This book will help you gain the power of Assembly Language thru Basic and will make possible various intricate cassette, disk and printer operations. It will also help you utilize the System Configuration and 'GET UNDERNEATH THE COVER' of the Color Computer.

This book includes POKES, PEEKs & EXECS to:
Autostart your Basic programs.

Disable Color Basic commands like LIST, LLIST, POKE, EXEC, CSAVE, CSAVEM, CLOAD, CLOADM and NEW.
Disable ECB commands like DEL, EDIT, TRON, TROFF, DLOAD, RENUM, PCLEAR and PRINT USING.

Disable Color Basic commands like DIR, SAVE, KILL, LOAD, MERGE, RENAME, DSKINI, BACKUP, DSKIS and DSKOS.
Disable BREAK KEY, CLEAR KEY and RESET BUTTON.

Generate a Repeat-Key.
Transfer ROMPAKS to tape (for 64k only).
Speed Up your Basic programs.
Reset, MOTOR ON and MOTOR OFF from keyboard.
Restart your Basic program thru RESET BUTTON.
Produce Key-Clicks and Error-Beeps.



Recover Basic programs lost by NEW, ?IO ERRORS and faulty RESET.

Set 23 different GRAPHIC/SEMIGRAPHIC modes.

Set 15 of the most commonly used Printer Baud Rates.

Allow you more plays on 23 of your favorite arcade games.
AND MUCH MUCH MORE!!!
COMMANDS FULLY COMPATIBLE WITH 16K/32K/64K COLOR BASIC/ECB CASSETTE & DISK SYSTEMS AND CoCo I AND CoCo II

ONLY \$16.95

ORDER TODAY! Visa, MC, Check or MO. COD add \$2.50. Please add \$2.00 S&H (foreign \$3.00 S&H). NYS residents please add sales tax. ALL orders shipped WITHIN 24 HOURS!!



MICROCOM SOFTWARE
PO Box 214, Fairport, NY 14450

PH: (716) 223-1477

(9AM — 9PM — 7 Days a Week).

Dealer Inquiries Invited.



Color Power IITM

Expands Your CoCo to CP/M[®] 2.2

*** COLOR POWER II FEATURES ***

01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22

INCLUDES CP/M 2.2 WHICH ALLOWS YOU TO RUN THOUSANDS OF CP/M PROGRAMS
GENERATES HIGH QUALITY 80 COLUMN BY 24 LINE DISPLAY AS IN THIS REAL PHOTO
WITH UPPER and lower case characters on your composite video monitor,
INSTRUCTIONS INCLUDED ON USING MOTOROLA 6845 DIRECTLY FROM YOUR CoCo
INCLUDES SEPARATE POWER SUPPLY (HELPS KEEP YOUR CoCo COOL)
INCLUDES POWERFUL FOUR MHZ Z-80A MICROPROCESSOR
SUPPORTS DOUBLE-DENSITY DISK FORMATS FOR MAXIMUM STORAGE CAPACITY
ABSOLUTELY NO 64K CoCo OR CoCo II HARDWARE MODIFICATIONS NEEDED
OPTIONAL Ultra Term + by Double Density Software: ALLOWS
YOUR CoCo TO OPERATE AS AN 80 COLUMN BY 24 LINE COMMUNICATIONS TERMINAL
POPULAR CP/M SOFTWARE AVAILABLE

0000000001111111122222222223333333334444444445555555556666666667777777778
123456789012345678901234567890123456789012345678901234567890

Plug Color Power II into the expansion port of your 64K CoCo or CoCo 2, plug your disk controller into Color Power II, and insert our disk into your drive. You are now ready to run thousands of CP/M programs such as WordStar[®], MailMerge[®], SpellStar[®], and StarIndexTM and to run Ultra Term + to create an 80 column by 24 line terminal.

Your CoCo is now a CP/M compatible computer that includes CP/M 2.2 and generates an 80 column by 24 line display on your 80 column monitor with upper and lower case characters.

Introductory Prices:

Color Power II (includes CP/M 2.2)	\$329.00
Add Ultra Term +	\$ 55.00
Color Power II plus WordStar [®] & MailMerge [®]	\$498.00
Add SpellStar [®] and StarIndex TM for only	\$ 79.00

Call or send check, money order, Visa or MasterCard number with expiration date to the address below. N.J. residents add 6% sales tax.



Color Power Unlimited, Inc.

1260 Springfield Ave., P.O. Box 606-F, New Providence, N.J. 07974 (201) 665-9646

BOW, December 1983, Page 131), *Musica* (Speech Systems) or any other music programs. I hope to not only gain new music programs, but also new friends.

Write me at: 539 S. Berthe Avenue, 32404.
Mikel Rice
Panama City, FL

KUDOS

Editor:

A colleague just passed me the July RAINBOW and drew my attention to the article about the *Arconix Assignment* [Page 90]. I read this article with a lot of interest. It is quite an original idea to develop a computer game with a scent sheet.

Myra Prinsen
Tilburg, Holland

Editor:

You are obviously very proud of your magazine and rightfully so. With that in mind here is a bit of trivia for you.

I recently purchased from the Jesse Jones Box Corp. a set of magazine binders to file my RAINBOW copies, and I recommend these to everyone. When I got them all put into the binders I was profoundly impressed with the weight. I subscribed in October of 1982 so the three copies of that year did not get bound but they weighed 2.5 lbs., 1983 weighed 9.0 lbs., and up to July of 1984 they weighed 8.5 lbs. That represents a lot of paper, a lot of printing and one heck of a lot

of editing and planning. I did not go so far as to calculate the number of characters per copy but it might be interesting and would be staggering.

The magazine has been a "God-send" to me, as I am a self-taught computer nut. Keep up the good work. You have a right to be proud.

Ken Burdon
Barrington, RI

CLUBS, CLUBS, CLUBS

Editor:

The Colorado Color Computer Club meets the first Wednesday of the month at 7 p.m. at the Westminster Public Library, 3031 W. 76th Avenue. For more information, call (303) 650-9768 or 427-1925, or write P.O. Box 33492, 80233.

Lee R. Castens
Westminster, CO

Editor:

This is to announce the existence of the CoConuts, a Color Computer Users Group. We started our group in February and are having good success after nine months of activity and organization. We have 17 members and new inquiries weekly. Most of the interest is in wanting to know more about this new activity — computing. Our address is: CoConuts, 1610 N. Marlan, 65803. Or call (417) 485-3419.

Steve Kuttel
Springfield, MO

Editor:

We would like to let all the Columbia, S.C. area Color Computer users know that there is a tutorial group in Columbia dedicated exclusively to the Radio Shack, TDP 100, and work-alike Color Computers. This group meets twice a month and each meeting is a classroom type tutorial from bare BASIC to the latest software on the market. Tutorials are given by the members who are using Color Computers in their workplace and hobbyists who simply enjoy learning and sharing more about their machines' potential. I invite anyone who wishes to learn more or share their knowledge to call me at (803) 786-0541 or write to 3562 Linbrook Drive, 29204 for more information on the "Invitational Software Group."

Tom Reed
Columbia, SC

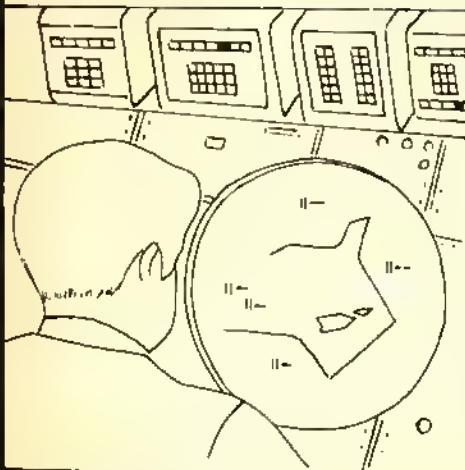
STRAIGHTENING THE PIPELINE

Editor:

I am writing in response to the "premature" announcement in September's Pipeline column on Page 136 of THE RAINBOW. To set the record straight, Spectrum Projects is the only distributor of Jeff Francis' *Disk Utility 2.1* program that was reviewed in the October 1984 [Page 220] RAINBOW.

Bob Rosen, President
Spectrum Projects

It's Here! REALISTIC, FULL-FEATURED... AIR TRAFFIC CONTROL SIMULATOR NEW



Face the Challenge — Develop the Skills for Air Traffic Control (ATC). Combines Approach, Departure, Enroute and Tower Control.

- 100% machine language.
- Dramatically exploits the CoCo's processing capability.
- Simulates 40 mile x 10,000 ft. surveillance volume.
- Realistic radar presentation displays airborne and surface traffic.
- Pilot-to-Tower/Tower-to-Pilot communications.
- Develops ATC skills (e.g. traffic separation, approach/departure vectoring, sequencing, and tower procedures).
- Randomly portrays light and high performance aircraft in both visual (VFR) and instrument (IFR) situations.
- Effects of simulated local weather conditions incorporated.
- Scoring system provides feedback on controller performance.
- Three levels of difficulty (traffic density).
- Controller must respond to both visual and sound cues.
- Comprehensive manual includes tutorial on Principles of Air Traffic Control.
- Quick reference card included.

Will Challenge, Entertain and Impress CoCo Users, Simulation Hobbyists and Aviation Enthusiasts.

BETASOFT SYSTEMS

P.O. Box 1174
Smithtown, New York 11787
(516) 666-7240

Dealer Inquiries Invited

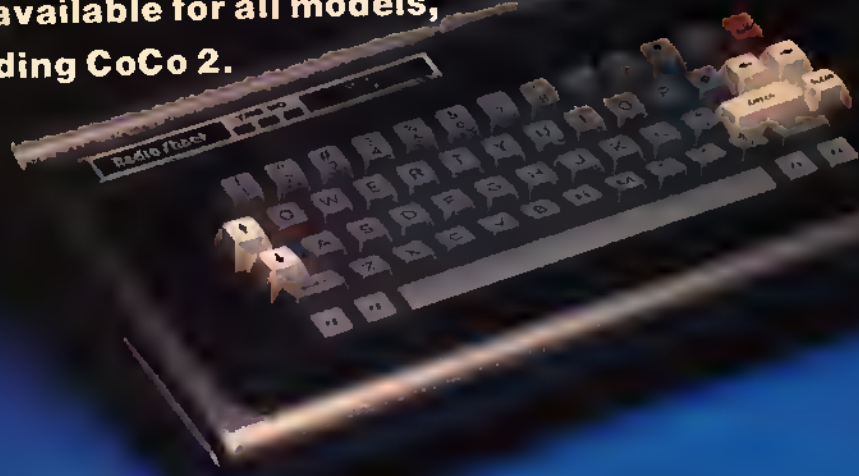
32K Required

Tape \$34.95 Disk \$37.95

- No delay for personal checks.
- Money Orders welcome.
- Please add \$2.00 postage & handling.
- COD's additional \$2.00.
- N.Y.S. residents add sales tax.

The HJL-57 Keyboard

Now available for all models,
including CoCo 2.



Compare it with the rest. Then, buy the best.

If you've been thinking about spending good money on a new keyboard for your Color Computer, why not get a good keyboard for your money?

Designed from scratch, the HJL-57 Professional Keyboard is built to unlock ALL the potential performance of your Color Computer. Now, you can do real word processing and sail through lengthy listings...with maximum speed; minimum errors.

At \$79.95, the HJL-57 is reasonably priced, but you can find other CoCo keyboards for a few dollars less. So, before you buy, we suggest that you compare.

Compare Design.

The ergonomically-superior HJL-57 has sculptured, low profile keycaps; and the three-color layout is identical to the original CoCo keyboard.

Compare Construction.

The HJL-57 has a rigidized aluminum baseplate for solid, no-flex mounting. Switch contacts are rated for 100 million cycles minimum, and covered by a split-proof membrane.

Compare Performance.

Offering more than full-travel, bounce-proof keyswitches, the HJL-57 has RFI/EMI shielding that eliminates irritating noise on displays; and four user-definable function keys (one latching), specially-positioned to avoid inadvertent actuation.

Free Function Key Program

Your HJL-57 kit includes usage instructions and decimal codes produced by the function keys, plus a free sample program that defines the function keys as follows: F1 = Screen dump to printer. F2 = Repeat key (latching). F3 = Lower case upper case flip (if you have lower case capability). F4 = Control key; subtracts 64 from the ASCII value of any key pressed. Runs on disc or tape; extended or standard Basic.

Compare Installation.

Carefully engineered for easy installation, the HJL-57 requires no soldering, drilling or gluing. Simply plug it in and drop it right on the original CoCo mounting posts. Kit includes a

new base for a totally finished conversion.

Compare Warranties.

The HJL-57 is built so well, it carries a full, one-year warranty. And, it is sold with an exclusive 15-day money-back guarantee.

Compare Value.

You know that a bargain is a bargain only so long as it lasts. If you shop carefully, we think you will agree...The HJL-57 is the last keyboard your CoCo will ever need. And that's real value.

Order Today.

Only \$79.95, the HJL-57 is available for immediate shipment for either the original Color Computer (sold prior to October, 1982) or the F-version and TDP-100 (introduced in October, 1982), and the new 64K CoCo. Now also available for CoCo 2.

**Call Toll Free
1-800-828-6968**

In New York 1-800-482-4881



PRODUCTS

Div. of Touchstone Technology Inc.
955 Buffalo Road • P.O. Box 24
Rochester, New York 14624

Telephone (716) 255-3333

Ordering Information: Specify model (Original, F-version, or CoCo 2). Payment by C.O.D., check, MasterCard or Visa. Credit card customers include complete card number and expiration date. Add \$2.00 for shipping (\$3.50 for Canada). New York state residents add 7% sales tax. Dealer inquiries invited.



One of the absolutely best things about being able to have some association with THE RAINBOW is the opportunity to meet and share information with so many of you in various parts of the country. As just about everyone reading this column knows, we have three RAINBOWfests — our own shows — each year, and these give me a chance to meet thousands of CoCoists each time.

But we attend other shows, too, and those also give me a chance to see a lot of people. And, by the time you read this, we will have participated in a number of the Radio Shack computer showcases as well. Since we also publish PCM — *The Magazine for Professional Computing Management*, which covers the Model 100 and the Tandy 2000, this will be a special series of shows because we will be able to see many people whom we feel we support, but who do not attend RAINBOWfest (and rightly so) because they own something other than our CoCo.

One of the best things about talking with people at shows, whether they be RAINBOWfests or something else, is to see how very deeply interested many are in the Color Computer. And, from those shows, not a little bit of interest is generated in the advertising part of the business.

I was having just such a discussion a couple weeks ago at the National Software Show in Los Angeles and, interestingly, a couple of days later at the Byte Computer Show in San Francisco. Both of the people I was talking with suggested that we were "selling" a good product with RAINBOW advertising because, from everything they had heard, the market was receptive to new and good products.

I told both of them that, to my mind, we were not so much in the business of selling advertising as we were in selling success. One of them made the comment — which I felt was a very nice and kind one — that we were, in fact, selling the hopes and dreams embodied in a rainbow.

Rainbows, after all, mean more than the pot of gold that is supposed to be at their end. And, even though I sort of stumbled on the name, rainbows have to mean people's ideas for hopes and dreams. Dorothy, you will remember, wanted to travel "Over The Rainbow."

I started thinking back across the three-plus years we have been around. Remembering some of the people who started with us, and those who came along later, it is really nice to recall what they were doing when they started and what they are doing now.

Several days later, and virtually marooned in St. Louis by a flight to Louisville that was due in at 9:30 p.m., but ended up (sans luggage) arriving at 3:30 a.m., I had some time to leaf through THE RAINBOW and recall what some of our advertisers were doing when they started with us.

An electrician, a copier repairman, a radio announcer, a housewife, a teacher, and a bunch of other people were doing things they "sort of" liked, but didn't think were so very special. Now, they have businesses — some large, some smaller — and are very involved with something they really like: working with their CoCo. The interesting thing about all of this is the two people I had specifically talked with were both working in other jobs, but wanting to "be in business" for themselves with CoCo.

The point of all this is that you can do that, too. If you have a program or two, or just an interest in writing a program or two, you *can* get involved in all of this. And, with some attention to good business practices and the like, good marketing and caring for your customers, you may be in the position of having your own business, too.

In many ways I consider the Color Computer an idea machine — but it creates an ideal market, too. Consider the IBM, the Commodore, and some of the others. The costs of being involved in such a market are high. Compare our advertising rates — for ads which reach a vast majority of the CoCo Community — with those for *PC World* or *Compute's Gazette* or *Byte*. We're talking the difference between hundreds and thousands of dollars.

The purpose of all this is to say that if you have a yen to get into the CoCo market, and you think you have some good ideas, give it a try. A bunch of people have, and a bunch of people are glad they did.

Telewriter-64™

the Color Computer Word Processor

- 3 display formats: 51/64/85 columns × 24 lines
- True lower case characters
- User-friendly full-screen editor
- Right justification
- Easy hyphenation
- Drives any printer
- Embedded format and control codes
- Runs in 16K, 32K, or 64K
- Menu-driven disk and cassette I/O
- No hardware modifications required

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

...one of the best programs for the Color Computer I have seen...

— Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command. The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPVt/VIII, DMP:100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Termini, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

File and I/O Features: ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves, Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

*...truly a state of the art word processor...
outstanding in every respect.*

— The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs \$49.95 on cassette, \$59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec
704 Nob Street
Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

[Add \$2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.]

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.



SOFTMART OCTOBER SALES

SALE PRICES GOOD UNTIL NOVEMBER 15.

HARDWARE

LEGEND PRINTER 800	279.00
LEGEND PRINTER 1000	369.00
LEGEND PRINTER 1200	399.00
BOTEK PARALLEL INTERFACE — SAVE 15.00 IF ORDERED WITH ABOVE PRINTERS	
GORILLA GREEN MONOCHROME MONITOR	69.95
GORILLA AMBER MONOCHROME MONITOR	94.95
VIDEO PLUS	101.95
VIDEO PLUS IIM	22.45
HJL 57 PROFESSIONAL	79.95
J&M DISK CONTROLLER	139.00
64K UPGRADE KIT	45.95
SPECTRUM LIGHT PEN	17.95
PHILAN SWITCH BOX	39.95
(FOR CONNECTING PRINTER AND MODEM AT THE SAME TIME/DATA TRANSFER LIGHT)	
PHILAN 10FT EXT. CORD FOR PRINTER:	
MALE TO MALE	15.00
FEMALE TO MALE	15.00
PHILAN 10FT COCO JOYSTICK CABLE	15.00
PEEK AND POKES CAT. FOR COCO	15.00
LABELS-PINFEQ (1000)	12.00

SOFTWARE

CHOPPER STRIKE (MICHTRON)	25.00 (C/O)
CANDY CO. (INTRACOLOR)	30.50 (C/O)
WILLY'S WAREHOUSE (INTRACOLOR)	30.50 (C/O)
GALAGON (SPECTRAL ASSOCIATES)	21.50 (C)/25.40 (D)
TIMS MAIL (SUGAR)	17.95 (C)
TIMS (SUGAR)	20.95 (C)
QUEST 32K (AAROVARK)	21.50 (C)/26.30 (D)
NINJA WARRIOR (PROGRAMMER'S GUILD)	25.50 (C)
(GET SNOWFLOW FREE)	
DIETICIAN (NORTH GLENN)	19.95 (C)
MOON SHUTTLE (DATA SOFT)	29.95 (C/O)
BOOVAN (OATASOFT)	25.95 (C/D)
FROGGIE (SPECTRAL ASSOCIATES)	21.50 (C)/25.50 (D)
GRAPHICOM	26.95 (D)
GRAPHICOM PICTURE DISK IV	17.25 (D)
ELITE CALC	51.95 (C/O)
ELITE FILE	69.00 (D)
NEW WORLDS OF FLIGHT (TOM MIX)	27.95 (C)/30.95 (D)
WAREHOUSE MUTANTS (TOM MIX)	21.95 (C)/24.95 (D)
SALVAGE (PROPER PROGRAMS)	9.95
COCO CALIGRAPHER (SUGAR)	20.95 (C)/25.95 (D)
TUT'S TOMB (MARK OATA)	21.95 (C)/25.95 (D)
THE NORTH CAROLINA CARTOGRAPHER	24.95 (D) 32K EXT.
ANY MARK DATA GRAPHIC ADVENTURE	21.95 (C)/25.95 (D)
GLAZOR	24.95

WE PROUDLY PRESENT THESE NEW PRODUCTS
DISTRIBUTED BY SOFTMART

OEJAVU BEARGRIP SOFTWARE

AN EXTRAORDINARY TEST OF YOUR MEMORY SKILLS. YOU MUST MATCH HIDDEN PAIRS OF PICTURES. THE DIFFICULTY LEVEL MAY BE ADJUSTED FROM A PLAY FIELD OF 6 SQUARES (PRESCHOOL LEVEL) UP TO 132 SQUARES. A GOOD CHALLENGE FOR ALL AGES.

INTRODUCTORY PRICE 13.95 (C)/15.95 (D) 32K EXT.

"WORKBASE" FROM THE CREATORS OF HOMEBASE

AN INTEGRATED PACKAGE FOR BUSINESS THAT PERFORMS DATABASE, SPREADSHEET, WORD PROCESSING, AND MAIL MERGE FUNCTIONS ALL IN ONE.

INTRODUCTORY PRICE:
WORKBASE I 61.95 400 RECORDS
WORKBASE II 75.00 1200 RECORDS

"MATHS-TREK"

A CHALLENGING PROGRAM THAT CAN BE SET FOR ADDITION, SUBTRACTION, MULTIPLICATION, DIVISION, FRACTIONS AND SQUARE ROOT PROBLEMS. YOU COMMAND THE 'ENTERPRISE' AND YOUR MISSION IS TO RETURN BACK SAFELY TO 'STARBASE.' SUDDENLY YOU SPOT KLINGONS COMING WITHIN RANGE. TO INCREASE WARP YOU MUST ANSWER THE PROBLEM CORRECTLY IF NOT FOR AGES 6-12.

INTRODUCTORY PRICE 15.95 (C)

"YACHTSEE" BEARGRIP SOFTWARE

A GREAT COMPUTER VERSION OF THE POPULAR DICE GAME.

INTRODUCTORY PRICE 16.95 (C)/17.95 (D) 32K EXT.

WE ARE ACTIVELY LOOKING FOR GOOD PROGRAMS TO DISTRIBUTE.
WRITE FOR AUTHORSHIP/DISTRIBUTORSHIP PACKAGE.

SEND FOR YOUR FREE DESCRIPTIVE CATALOG (INCLUDE \$2.00 FOR SHIPPING AND HANDLING). PLEASE SPECIFY COMPUTER.

- MONTHLY SALES SHEET • ACCEPTANCE OF CHECKS WITH NO DELAY
- RALEIGH, NC STORE LOCATION COMPLETE WITH LIBRARY AND COMPUTER DISPLAYS.

MAIL ORDERS \$2.00 - 1ST CLASS / \$2.00 - UPS GROUND / \$4.00 AIR
\$2.00 - C.O.D. / NC SALES TAX 4 1/2%

MC & VISA WELCOMED

SOFTMART

5024E Departure Drive - Raleigh, NC 27604

ORDER ONLY INFORMATION
1-800-334-0854, EXT. 879 (919) 876-6124

Hey, after all, THE RAINBOW started as a two-page newsletter done, literally, on the kitchen table. I'm sure glad I got into it. And you may be, too.

The holiday season is coming and it might be just the time to start leaving hints for members of your family. Your pre-holiday shopping will probably include some things for your favorite computer. If a renewal subscription to THE RAINBOW is among them, do please remember to include your account number and get that order in before the first of the year.

Yes, there will be a small subscription price increase — but you will be able to renew at the old price (now \$28 in the U.S., with an appropriate postage surcharge for other countries). There will be more about this next month.

But, for now, we do have some attractive gift certificates available and those can be mailed to you for use in a stocking, under a tree or beneath a menorah. Hundreds took advantage of our gift program last year, and you can do the same again this year — and realize a savings to boot.

I suppose I should mention something new that we are doing here. We have formed another company called FPSS, Ag. Publishing Enterprises, Inc. Its purpose, essentially, is to publish magazines for other people.

We already plan to publish one beginning in the winter called *Fashion Licensing Review/Revue*, in cooperation with another party. Essentially, the magazine is his idea — we are providing the support for it.

The main difference between this and other publishing companies, however, is that FPSS, Ag. essentially goes into a sort of partnership with someone. This keeps costs really low. If you consider all the things necessary to start a magazine, it seems obvious that it is advantageous to use some things which are already in place. FPSS, Ag. is not a charitable undertaking, though. We expect to turn a profit. But, we will be able to do so through sharing the profits on the publication — not, as so many similar enterprises do, by marking up all of our services.

In short, if you have an idea, write to me. We might be able to get together.

— Lonnie Falk

One-Liner Contest Winner . . .

If you like helicopters, you'll enjoy this one-liner! Just type the program, *RUN* and watch that 'copter go!

The listing:

```
Ø DIMA(99):PMODE1:PCLS2:LINE(Ø,9
9)-(255,Ø),PRESET,BF:DRAW"BG145C
3R1BL9F4L462R6C1R2C3D2L14H2L4RU2
D4U2R2F2RBDR4F4L14E4C4":SCREEN1:
FORT=1T09999999:GET(3,176)-(255,
191),A,G:PLAY"T39D":PUT(Ø,176)-(
252,191),A,PSET:LINE(252,191)-(2
52,19Ø-RND(14)),PSET:NEXT
```

David Fitzsimmons
Lucas, OH

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.)

OS-9 SOFTWARE WITH X-TRA POWER

XTERM

XTERM is a full featured OS-9 communications program that takes full advantage of the power of OS-9. It works with the normal text screen, XSCREEN, or the Wordpak 80 column board.

XTERM is menu oriented for ease of use, it is simple to use even for the novice OS-9 user. And yet, XTERM is powerful enough for the expert OS-9 user.

Some of the features of XTERM include: full upload and download support with remote buffer operation; supports XON/XOFF protocol; 110/300/600/1200 baud, 5/6/7/8 bits, even/odd/no parity, full or half duplex; able to execute an OS-9 shell command from within XTERM.

XTERM works with a Color Computer using the standard serial interface, but also will work with a hardware serial port. Also, if you are using a hardware parallel printer port, you can print data to the printer as it is received.

XTERM \$59.95

XSCREEN

XSCREEN creates a high resolution screen for the Color Computer using OS-9. This high resolution screen gives you 24 lines of text with 51, 64, or 85 characters per line. Characters can be either white on a black background or vice versa.

XSCREEN is very easy to use because it is menu operated. No codes to memorize or manuals to consult when you want to change character size, just go to the menu.

XSCREEN \$19.95

XWORD

XWORD is a powerful word processing system for the Color Computer using OS-9. XWORD is feature packed with only a few features mentioned here.

Some of the editing features of XWORD include: true character oriented full screen editor; works with the normal text screen, XSCREEN, O-PAK, or WORDPAK 80 column card; full block commands with blocks displayed in inverse characters (except with normal text screen) for easy block manipulation; file size not limited to a buffer size; full find and replace commands with wildcard character; able to execute an OS-9 shell command in the middle of editing. Many, many more features, too many to mention here.

Some of the formatting features of XWORD include: proportional spacing supported; perfectly aligned hanging indents and columns, even when using proportional characters; full printer control with control of character size, emphasized, italics, overstrike, underlining (with or without spaces), super and sub-scripts; up to 10 header/footers; page numbering in decimal or Roman numerals; margins and headers can be set differently for even and odd pages; automatically reads printer initialization file to define XWORD for your printer (many included, and easy to write or modify your own). Many more features.

XWORD \$79.95

XED

XED is the editor portion of XWORD. XED includes all of the editing features listed under XWORD above. XED is for people who need a full featured screen editor but do not need all of the formatting power of a word processor.

XED \$49.95

 **MICROTECH
CONSULTANTS
INC.** 1906 Jerrold Avenue
St. Paul, MN 55112
Dealer Inquiries Invited



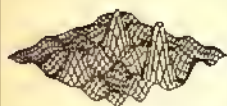
Ordering Information

Add \$2.50 shipping & handling. MN residents add 6% sales tax. Visa, Mastercard, COD (add \$2.50), personal checks; all shipped from stock within 24 hours.

(612) 633-6161

PROFESSIONAL, EDUCATIONAL, & BUSINESS

APPLICATIONS SOFTWARE
for the COLOR COMPUTER



PROFESSIONAL 3-D PLOTTER

Plots any function
or a data set

32K \$24.95



SPECTRUM ANALYZER

Mach. Language FAST Fourier Transform

32K \$24.95

PROPRIETOR'S ACCOUNTANT

NEW!

Complete Bookkeeping System
Screen or Printer Output

Double-entry General Ledger and Journal
Trial Balance, Profit/Loss, Balance Sheet

Keep YOUR expenses DOWN!
32K DISK ONLY \$29.95



MATHEMATICS



MATRIX MATH
[Inverse, Determinant] \$12.95

EQUATION EVALUATOR
[Polynomials, Linear Sets] \$12.95

FUNCTION FINDER
[Interpolation, Regression] \$12.95

CALCULUS
[Differentiation, Integration] \$12.95

All 4 MATH Programs \$44.00



EDUCATIONAL SIMULATIONS



STRATEGY POLITICS \$16.95

STRATEGY INVESTING \$16.95

IMAGE PROCESSING \$16.95

STRATEGY FOOTBALL \$16.95

STRATEGY BOXING \$12.95

All 5 SIMULATIONS \$69.95

Send CHECK or MONEY ORDER
Specify DISK or TAPE Ext. BASIC Req.
Add \$2.00 Shipping / Handling
Florida Residents add 5% Sales Tax

Write for FREE CATALOG



**ANKIA
RESEARCH**

901-19 INDIANTOWN RD.
SUITE R
JUPITER, FL 33458

BUILDING NOVEMBER'S RAINBOW

Our Telecomputing Issue . . .

Reading the Electronic Mail . . .

And, Rainbow On Tape, Right Now . . .

Telecommunications? Data Communications? Telecomputing? Strictly speaking, I suppose the terms are not interchangeable, but they're close enough that we'll treat them collectively in this issue of THE RAINBOW. We'll use "telecomputing" as the umbrella term since it seems to best fit our goal of opening up fascinating avenues for exploration through hooking up our Color Computers to other computers. Most often, this is done by telephone or a short cable, but, as our cover illustrates, yes, you can send and receive computer data via ham radio — or even broadcast facilities, for that matter!

If you have the right equipment — and a growing number of our readers do — you can point a home video camera at someone, or something, digitize the picture, and transmit it by ham radio to someone else who then decodes the signal he receives and reproduces the picture on his monitor or even prints out a copy. Not quite network television, but nonetheless a fun thing to do. If you haven't discovered the fun of telecomputing, you're missing a lot.

I won't recite the litany of opportunities that open up once you've added a modem and a terminal program to your CoCo setup, but, as a telecomputing junkie, I can tell you modem mania offers the same sort of consuming, magical allure that kept you up nights on end when you first got your Color Computer.

Myself, I'm a bit of a SIG addict; I get the itch at all hours of the night. In fact, the later the better since the several CompuServe Special Interest Groups I "visit" are less crowded in the wee hours of the morning. Full services like CompuServe, and private bulletin boards, too, are important to me, both for new information and for feedback on THE RAINBOW. When mistakes appear in THE RAINBOW or her sister publications, I usually hear about it first on CompuServe, even though a telephone call would get me a lot quicker.

While there are umpteen other things you can do when connected to a host computer like CompuServe, I like to simply "read the mail," not the private "EMAIL," but the open messages that appear on the various bulletin boards. In fact, I enjoy reading everybody else's mail because I learn a lot without having to compose a response or otherwise actively react. "Reading the mail" is a ham radio carry-over that makes more sense with computer bulletin boards than it does with amateur radio. It means to tune in and receive transmissions without transmitting yourself, a convenient way to learn the latest.

In addition to convenience, immediacy is a key attraction of telecomputing. For instance, you can get immediate delivery of RAINBOW ON TAPE through the CompuServe "Softex" service. At \$3.50 per individual program, you pay more than you will by purchasing the entire month's tape through the mail for \$8, but you get it right away — in minutes! Let's say you see an article in THE RAINBOW that excites you and you want that program; just call CompuServe and within minutes you'll have a copy of the program up and running. It costs, but it's for those who absolutely, positively want it right now — not tomorrow. As more and more people get "online," we'll see all sorts of similar services, at increasingly lower prices.

Want to get into telecomputing? Begin by scanning this issue of THE RAINBOW. We have a terminal program for you in this issue! We also show you how to add auto-answer to a Modem I and bring you an update on our own *Rainboard* bulletin board system that'll set you up to run your own BBS. You'll be "reading the mail" before you know it. And, for "reading in the mail," my usual reminder that a subscription to the Rainbow is the way to "download" more each month about the Color Computer than is available from any other source.

— Jim Reed

Graduate With DEFT Pascal



As a result of the programming language requirement of the Advanced Placement (AP) Tests, Pascal has become the standard language used in High Schools and Colleges today. On the Color Computer, DEFT Pascal is the standard.

DEFT Bench \$49.95

DEFT Edit

Full screen editor

DEFT Linker

(see DEFT Pascal)

DEFT Lib

create and maintain
program object libraries

DEFT Debugger

debug Pascal machine
programs symbolically

DEFT Macro/6809

supports entire 6809
instruction set,
lets you define your own
instructions

DEFT Pascal \$79.95

DEFT Pascal Compiler

complete Pascal language,
generates machine
language object

DEFT Linker

combines multiple program
objects into one binary
program

DEFT Pascal Workbench \$119.95 (DEFT Pascal And DEFT Bench Together)

All DEFT software and programs developed with DEFT software are BASIC ROM independent and use all of the memory in your Color Computer without OS-9. All you need is DEFT software and a TRS-80 Color Computer with Extended Disk BASIC, at least 32K of RAM and One Disk Drive. Software licensing arrangements are available for schools. Dealer inquiries welcome.

DEFTTM
SYSTEMS, INC.

For Product Questions Call

1-301-253-1300

For Credit Card Orders Call Toll Free 24Hrs

1-800-368-3238 Operator 8

In Virginia

1-800-542-2224 Operator 8

DEFT Products are also available through these fine
retailers:

THE PROGRAM STORE

1000 E. 1st St.

1000 E. 1st St.

Follen Library Book Co

DATAMAN International

Special Projects

C.S.I.

Quantity of Each: ☐ DEFT Pascal ☐ DEFT Bench
☐ DEFT Pascal Workbench

Method of Payment (check one) ☐ Check Enclosed
☐ VISA ☐ Master Card ☐ COD

Account Number

Card Expiration Date /

Signature

Name

Street

City State Zip

All orders are shipped UPS within 24 hours of receipt. Add 3% for shipping and handling; Maryland residents add 5% for State Sales Tax; add \$2.00 for COD.

DEFT Systems, Inc.
Suite 4, Damascus Centre
Damascus, MD 20872

Adding An

After reading Dr. Lane Lester's article in the November '83 issue of RAINBOW ("Rainboard"), I thought, "A bulletin board for CoCo; what a great idea!" My own BBS! Why, I could use only the *Remoterm* program and access my computer from work using my TRS-80 VIDTEX terminal.

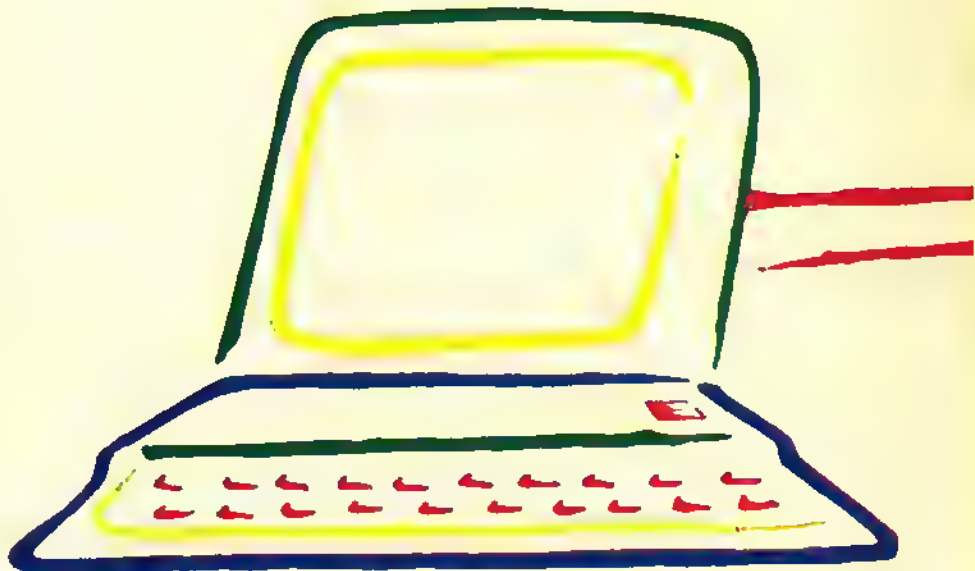
Ah, but there is a catch; I don't have an auto-answer modem. Hmm, I do have Radio Shack's Modem I. What follows is my attempt to add auto-answer to the TRS-80 Modem I.

This circuit is just that — an auto-answer. As long as it receives the caller's carrier tone it will stay on line. When the caller switches her modem off or hangs up the phone, the circuit disconnects. You cannot hang up from program control.

The complete unit fits inside your Modem I under the main board and draws power from the existing power supply. All of the parts can be obtained from your local Radio Shack. (See parts list.)

Now, here is the obligatory disclaimer: Warning: The Service Department General has determined that modification is dangerous to your warranty.

With that out of the way, please refer

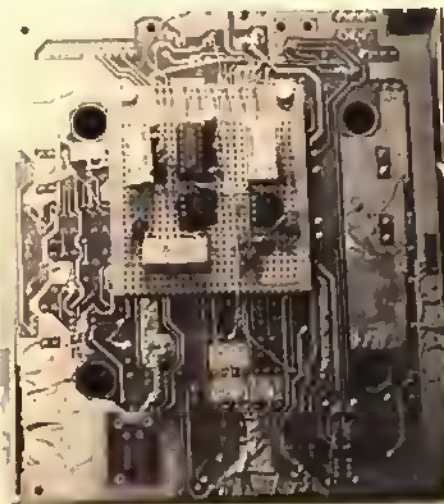


to the schematic for this discussion. IC1A, IC1B and IC2 detect the ring signal from the phone line and use it to trigger the timer, IC3. R4, C3 and D3 create a delay so that the phone is not answered too quickly. The timer, IC3, is set by R6 and C5 to give the caller about 10 seconds to switch her modem on. The output of IC3 is applied to the OR gate formed by D5, D6, R10, R11 and Q1. This pulls in the relay K1 and answers the phone. The carrier detect signal from the modem is applied to point 'B' and is delayed (about two seconds) and conditioned by IC1C and IC1D. It is then applied to the OR gate at Q1. As long as the carrier detect signal is present, the relay will stay pulled in no matter what the timer does. When the caller hangs up and the carrier detect goes away, the relay drops out and the phone is released, ready for another caller.

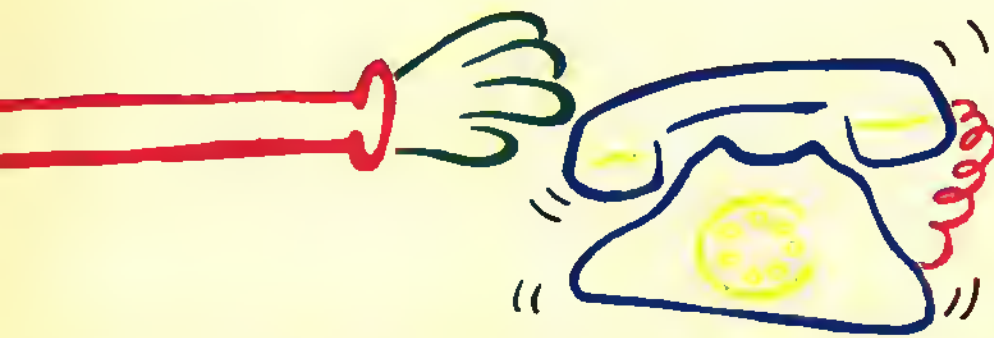
If the circuit answers the phone too quickly or slowly for your tastes, you can change the time constant by changing the values of R4 or C3 or both. If you want more rings, increase the values. If you want fewer rings, decrease the values.

Switch S1 turns the power on to the modem and connects the carrier detect line. Mount it on the top panel of the modem under the CD light, where there is a hole. You may have to cut the lugs

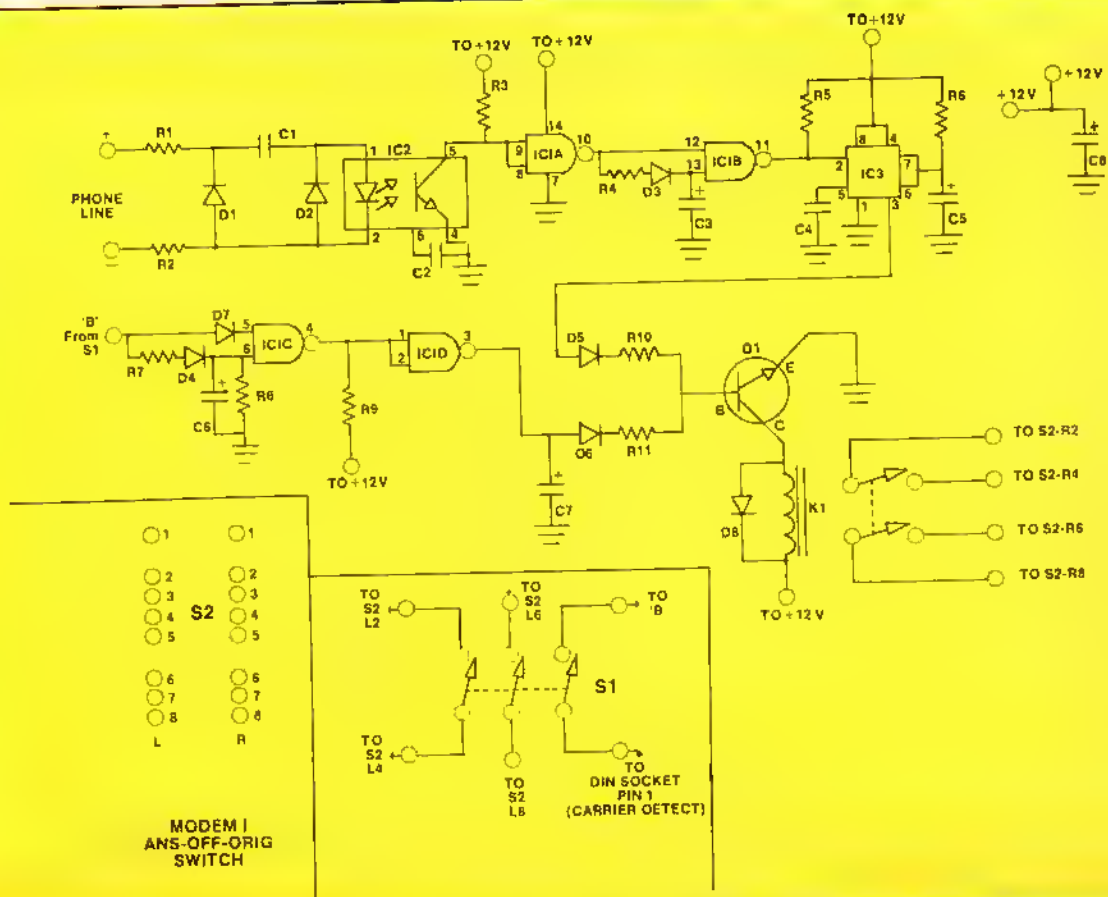
(Tony Sharp, a watchmaker and jeweler, has been involved in computing for only three years but has an extensive background in electronic communication. He holds both commercial and amateur radio operator's licenses.)



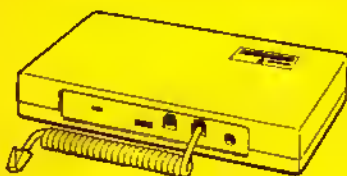
Auto Answer



By Tony Sharp



GET ON LINE FOR \$79



AUTOTERM
 TURNS YOUR COLOR COMPUTER INTO THE
WORLD'S
SMARTEST TERMINAL!
 YOU'LL ALSO USE AUTOTERM FOR SIMPLE
 WORD PROCESSING & RECORD KEEPING.

SIGNALMAN COLOR

REG. \$99

MODEM

ONLY

\$59.95

SPECIFICATIONS

Data Format	Serial binary, asynchronous						
Operate Mode	Manual dial, Automatic ANSW/ORIG selection						
Data Rate	0 to 300 bps, full duplex						
Modulation	Frequency shift-keyed (FSK)						
Line Interface	Direct-connect						
Data Interface	RS-232C compatible, built-in cable to computer						
Transmit Frequency	<table border="0"> <tr> <td>MARK SPACE</td> <td>ORIG 1270 Hz</td> <td>ANSW 2225 Hz</td> </tr> <tr> <td></td> <td>1070 Hz</td> <td>2025 Hz</td> </tr> </table>	MARK SPACE	ORIG 1270 Hz	ANSW 2225 Hz		1070 Hz	2025 Hz
MARK SPACE	ORIG 1270 Hz	ANSW 2225 Hz					
	1070 Hz	2025 Hz					
Transmit Frequency Accuracy	± 0.01%						
Transmit Level	-12 dBm typical						
Receive Frequency	<table border="0"> <tr> <td>MARK SPACE</td> <td>ORIG 2225 Hz</td> <td>ANSW 1270 Hz</td> </tr> <tr> <td></td> <td>2025 Hz</td> <td>1070 Hz</td> </tr> </table>	MARK SPACE	ORIG 2225 Hz	ANSW 1270 Hz		2025 Hz	1070 Hz
MARK SPACE	ORIG 2225 Hz	ANSW 1270 Hz					
	2025 Hz	1070 Hz					
Receive Frequency Tolerance	± 0.5%						
Carrier Detect Threshold	-44 dBm typical						
Carrier Detect Indicator	Audible tone						
Power Requirement	Internal 9V transistor battery or 110 VAC through adapter						
Size	8 1/2" x 4 1/2" x 1 1/2"						

* Not included

Cassette \$39.95

Diskette \$49.95

- * Total Communications Capability
- * Send/Receive Text, Graphics, & ML Programs
- * Scroll, Search, Edit, Load, Save while On Line
- * Built-in Word Processor
- * HI-RES Lower Case is Optional & Fast
- * Screen Widths of 32, 40, 42, 51, & 64
- * Many Printer Options
- * Optional Key-BEEP & Error Beebop
- * Automatic Block Graphics
- * Unbelievable Keystroke Multiplier Abilities

**SPECIAL
 PACKAGE
 PRICE**

**SIGNALMAN MODEM
 & AUTOTERM**

A.C. ADAPTER \$8.95

\$150 VALUE

ONLY

\$79

SUPER SPECIALS

MEDIA STORAGE DISKETTE

FLIP 'N' FILE 10	\$ 4.95
FLIP 'N' FILE 15	\$ 7.95
FLIP 'N' FILE 50	\$21.95
FLIP 'N' FILE 25 LOCK	\$21.95
FLIP 'N' FILE 50 LOCK	\$29.95

TWO WAY RS-232 SWITCH	\$26.95
SURG SUPPRESSOR 6 OUTLET WITH BREAKER AND SWITCH	REG. \$69.95 \$39.95
HEAD CLEANING KIT (DISK)	
REG. \$29.95	\$19.95

COLOR TERM + PLUS +

Now even more +PLUS+ features than before!!!
 New and Improved!!!

An Intelligent Terminal Program For The Color
 Computer or TDP 100.

- * Communications BAUD rate: 110-19200
- * Change printer BAUD rate: 600-9600
- * Select printer line feeds if needed
- * Select Half or Full Duplex
- * Select Odd, Even, or No Parity
- * Select 7 or 8 Bit Words
- * Select 1 or 2 Stop Bits
- * Send Control Characters
- * Separate Keys for Escape & Delete (Rubout)
- * Turn off those UGLY Lower-case letters
- * Word Wrap — eliminate all split words
- * Selectable Reverse or Normal Video

**THE BEST
 YOU CAN BUY**

COLORCOM / E

SMART TERMINAL PACKAGE

**A GREAT
 BUY!**

**ORDERING
 INFORMATION**

ADD \$2.00 PER ORDER
 FOR SHIPPING.
 WE ACCEPT VISA, MASTERCARD,
 CHECKS, M.O.
 C.O.D. ADD \$3.00 EXTRA.
 California Residents, Add 6%

- * Complete Upload and Download Support
- * Online Cassette/Disk Read and Write
- * 110, 300, 600, or 1200 Baud
- * Full or Half Duplex
- * Preenter Data Before Calling (Saves SS's)
- * Online and Offline Scrolling
- * ROM Patch or Disk
- * Automatic Capture of Files
- * Send All 127 ASCII Characters from Keyboard
- * Word Mode Eliminates split Words
- * 7 or 8 Data Bits (Including Graphics Support)
- * Efficient Data Storage S-I-M-E-I-C-H-E-S Memory
- * 100% Compatible w/ Rainbow Connection BBS II
- * Disk Version-BLK and H-Rex screen now available!

COLORCOM/E \$49.95

Sales Tax to Orders

SALE PRICE GOOD THRU 12/31/84



SOFTWARE PLUS



6201 C Greenback Lane

(916) 726-8793

Citrus Heights, CA 95610

shorter to keep it from hitting the board.

Switch S2 is the existing ANS-OFF-ORIG in the modem. It must be in the "OFF" position when using auto-answer. The view of the switch terminals in the schematic is from the bottom (underside) of the modem circuit board.

The Modem I connects the phone line via a cable that plugs into your modular jack. It is at the modem board end of this cable that you make the connections I call Phone Line '+' and '-'. In my installation the red wire is positive and the green wire is negative. You should check this out with a VOM before making those connections.

The auto-answer board is powered from the modem board; so we need to locate the point I call '+12'. When you first open the case, look at the lower center of the board and you will see U1. This is the 12-volt regulator. It is a square-looking device with three pins and is secured with a screw. With the board oriented with U1's pins to your left, the pin you want is the one nearest you. Locate this point on the bottom of the board and you have +12. Remember to connect the auto-answer board's ground to the modem board's ground.

I picked up the carrier detect signal from pin-1 of the DIN socket at the rear of the board.

The prototype was built on a small perf board and wired point to point. Parts placement is not critical. If you use IC sockets (you'll be glad you did), be sure to use the low profile type and do not use one for the relay K1; there is not enough room.

It is a good idea to bring all the external connections out to the end of the

board to terminals. (I used short, stiff pieces of wire.) This makes it easier to wire it to the modem.

The auto-answer board is mounted on the underside of the modem board. Luckily there are two fairly large ground pads in just the right spot to mount the board. Solder a number six nut on each of the pads to match the spacing of the holes in the board and use two short screws to attach it. Be certain that there is enough spacing between the auto-answer board and the modem board but not too much. It's pretty tight in there.

"The complete unit fits inside your Modem I under the main board and draws power from the existing power supply."

Please be sure to check and recheck all connections. We don't want to blow up the modem! When you have everything wired up, boxed up and ready, plug the modem into the phone jack and to the computer. (It will not work if you have the printer plugged in instead!) Load in your communications program, set the mode switch to "OFF" and set the auto-answer switch (S1) to "ON." At this time the "ON" LED should be lit. Have a friend call you, but tell her to just listen and not turn her modem on. After your modem answers the phone she should hear your carrier tone for

about 10 seconds after which your phone should hang up. This tests the time out timer. Now have her call you again and go on-line just like she would if calling a BBS. When she switches her modem on, your CD light should come on. You can now proceed to communicate with your new auto-answer modem! If you have any problems, turn the modem off and check all connections and wiring.

An entirely new area of data communication is now possible for you without any great expense. So, go ahead and set up your own bulletin board or remotely accessed computer. The possibilities are endless.

I will be glad to answer any questions I can if you send a SASE to Tony Sharp, 118 W. Solomon St., Griffin, GA 30223.

PART	VALUE	R.S. Part Number
R1,R2	39k .5W	271-041
R3,R5&		
R6,R9	1meg .25W	271-1356
R4,R7&R8	220K .25W	271-1350
R10,R11	1K .25W	271-1321
C1	.47uf 250v	272-1054
C2	470pf Disc	272-125
C3,C5&C6	10uf Tnt.	272-1436
C4	.01 Disc	272-131
C7	470nf	272-957
C8	22uf Tnt.	272-1437
D1	1N4005	276-1104
D2 through		
D8	1N914	276-1620
IC1	CD4011	276-2411
IC2	H11A1	276-1654
IC3	NE555	276-1723
Q1	2N2222	276-2009
K1	DPDT 12v Relay	275-213
S1	3PDT Switch	275-661
Board		276-168
Sockets		Low Profile

Compugenesis
presents
"The CoCo Complete"

**A Videotape for all CoCo users,
from beginner to advanced**
90 minutes in color
Special Introductory Offer
Buy Now and Save!
\$59.95—VHS and Beta II
plus \$2.50 shipping
and handling
NY residents
add local
sales tax

"The CoCo Complete"
is for

Home and Office Use

- ☐ CoCo hardware and software demonstrations
- ☐ how to perform CoCo upgrades, maintenance
- ☐ hook up procedures
- ☐ all CoCo applications

Educators

- ☐ Classroom support package available, write for details

Foreign CoCo Users

- ☐ the tape is obtainable in any world standard, write for prices

Compugenesis
41-48 40th St. Sunnyside, NY 11104

Name _____
Address _____
City _____ State _____
Zip _____
Please allow 8-10 weeks for delivery.

☐ VHS ☐ Beta ☐ 3/4"
☐ check or ☐ money order enclosed



Peripherals
Corporation

THE INTRONICS EPROM PROGRAMMER

Price: \$140.

NEW VERSION 2.5

- ☐ Plugs into ROM pack port.
- ☐ Now programs 8K X 8 EPROM in 15 Seconds.
- ☐ On board firmware included.
- ☐ No personality modules required.
- ☐ Will program most EPROM's.
- ☐ High quality zero insertion force EPROM socket.

Enclosed in
Molded Plastic Case



Peripherals
Corporation

SPLC-1 Lower Case FOR THE COLOR COMPUTER & TDP-100

FULLY ASSEMBLED, TESTED
& GUARANTEED FOR 90 DAYS

\$59.95

☐ TRUE LOWER CASE CHARACTERS ☐ NO CUTTING OR SOLDERING ☐ FULLY COMPATIBLE WITH ALL TRS-80C (SPECIFY REVISION BOARD) [NOT COMPATIBLE WITH COCO 2] ☐ INVERTED VIDEO AT A FLIP OF A SWITCH

YOUR SOURCE FOR THE COLOR COMPUTER

*DRIVE 0 FOR COCO \$329
*DRIVE 1 FOR COCO \$198
*GUARANTEED FOR ONE FULL YEAR

*DISK CONTROLLER FOR COCO \$139
*RS-232 PORT EXPANDER \$ 30
*POWER-ON L.E.D. KIT \$ 6
*FRONT RESET SWITCH KIT \$ 7
*LIBRARY CASE HOLDS 70 DISKS \$ 23
*NEW MULTI-COLOR RAINBOW DISKS .. \$ 25
*ELEPHANT DISKS SSDD \$ 23
*8 PRIME 64K RAM-CHIPS \$ 50
*GEMINI 10X PRINTER \$299
*HAYES SMART MODEM 300 \$215
F.A.S.T. UPGRADE SERVICES \$CALL!



(Dealer Inquiries Invited)

- MINIMUM \$2.00 SHIPPING & HANDLING.
- NYS RESIDENTS ADD SALES TAX.
- ALL OTHER ORDERS ADD 4% SHIPPING.

*OS-9 IS A REGISTERED TRADEMARK OF MICROWARE, INC.

NEW SOFTWARE

OS-9BBS \$89.95

- ☐ MULTI-USER CAPACITY ☐ FASTER THAN MOST BBS'S
- ☐ MULTI-TASKING (NO LONGER COMPLETELY TIES UP YOUR COCO) ☐ REQUIRES OS-9 AND BASIC 09

OS-9 40-Track
Program \$24.95

- ☐ NOW OPERATE 35/40/80 DOUBLE SIDE, DOUBLE DENSITY DRIVES UNDER OS-9

64K Terminal
Package \$19.95

- ☐ AFFORDABLE ☐ REQUIRES 64K MEMORY ☐ GIVES YOU 52-58K BUFFER ☐ WRITES TO DISC ☐ READS IN FROM DISC ☐ STANDARD DISPLAY



Peripherals
Corporation

62 COMMERCE DRIVE
FARMINGDALE, NY 11735
(516) 249-3388

Formerly Saturn Electronics Company Inc.

Make listing lines easier with . . .

EZ List

By Michael Davidson

EZ List, a machine language utility program, was written to eliminate the need to use the SHIFT @ keys to control program listing. This program will allow you to use the up and down arrow keys to list one line at a time.

Type in the BASIC listing and save a copy to tape before running it. It will be erased after it has put the machine code into memory.

First the BASIC program will find the top of memory (Line 140). It will then clear enough space for the machine code (Line 150) and find the new top of memory on Line 160.

Lines 170 to 200 read the DATA statements and place them in the pro-

TECTED memory. Line 210 starts the machine code. Line 220 finds the start of BASIC to be used by Line 230. Line 230 places two zeros at the start of BASIC to effectively erase the BASIC program. Line 240 places zeros in a memory location that is used by the interpreter to remember what line it is working on.

The start section changes two memory locations to enable the computer to jump to the EZ List code when a key is pressed.

The second section, PRINT, is the first place the computer jumps to when a key is pressed. The print routine checks to see if the up arrow key has been pressed. If it has, its value will be changed from 94 to one. This will prevent the computer from printing the up arrow.

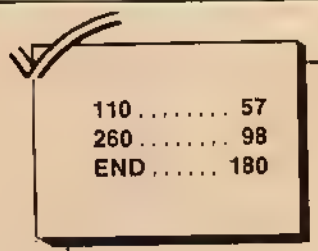
The third section, INPUT, is the main part of the program. It checks to see if

either of the arrow keys have been pressed. If so, this routine finds the next higher and lower line numbers and their addresses. It then calls the LIST subroutine.

The LIST routine calls the ROM routines that decode the program line and print it on the screen.

One final note: If you are going to be loading several programs with EZ List running, use the LIST command as soon as the new program is loaded from tape or disk. The computer remembers where the last line was, even when a new program is loaded. Depending on what the line addresses are, EZ List may find the next line. If it doesn't, the computer will hang up. If this should happen, don't worry, just press the Reset switch and type LIST and press ENTER. This will restore control without destroying your program.

(Michael Davidson, a service technician for Diebold Inc., works on alarms, automated teller machines and remote banking equipment.)



The listing:

```
10 'EZLIST
20 'BY MICHAEL DAVIDSON
30 'FARGD ND
40 '11/83
50 'THIS BASIC PROGRAM IS USED
    TO LOAD THE MACHINE CODE
    INTO UPPER MEMORY
```

```
60 'AFTER THE MACHINE CODE IS IN
    PLACE THE BASIC PRDGRAM WILL
    BE ERASED
70 'USE THE UP AND DDWN ARRDW
    KEYS TO LIST ONE LINE AT A
    TIME
80 'THE LIST CDMMAND WILL STILL
    WDRK AS IT DID BEFDRE.BUT
    NOW THE SHIFT @ CDMBINATIDN
    WILL NOT BE NEEDED
90 'WHEN LOADING PRDGRAMS FRDM
    TAPE OR DISK USE THE LIST
    COMMAND BEFDRE USING THE UP
    AND DDWN ARRDW KEYS
```

"The Best Typing Teacher For The Color Computer"

E.T.T. Electronic Typing Teacher

by
CHERRYSoft



Learning to type the right way can save you hours of tedious work when entering programs into your CoCo, and this is just what ETT was designed to do. Devote a little time every day practicing with ETT and before you know it you will be typing with confidence. Entering those programs will no longer be the chore it used to be.

ETT's video keyboard lets you practice with all the keys labeled, all the keys blank or only the "home" keys labeled. The visual cues guide you while you learn to type without watching your fingers. ETT shows your accuracy, response time, and words per minute. You will quickly see that you are improving with practice.

With the sentences provided by ETT learning to type can be fun. Over 1000 variations chosen because they include every letter in the alphabet. You can also create your own practice sets. This outstanding program was written by a certified teacher and professional programmer and comes with a ten page student manual-study guide. Requires 16K Extended Basic.

Cassette **\$21⁹⁵** plus \$2⁰⁰ shipping

"It's fairly obvious to someone with a couple of decades of typing experience that a professional instructor was instrumental in setting up this sophisticated program. It is a serious program for the person who wants to learn to type. It is not a game by any means, but it does make learning fun."

...an incredible value"

RAINBOW REVIEW
JULY 1984

"We bought the program ETT from you and it is an excellent tape for drilling and learning."

ST. ISIDORE SCHOOL
NEWTON, WISCONSIN

"Just received Electronic Typing Teacher. It is the best typing tutor for Color Computer — Thanks."

TOMLINSON JR. HIGH SCHOOL
FAIRFIELD, CONNECTICUT

ETT is now being used by schools and colleges throughout the U.S.

See E.T.T. at your favorite dealer or order direct.

DEALER INQUIRIES INVITED

SOFTWARE AUTHORS... Let us market your program.

**CoCo
Warehouse**

Where Shopping By Mail Is "USER FRIENDLY"

500 N. DOBSON • WESTLAND, MI 48090

Phone (313) 722-7957

```

100 'THIS WILL PREVENT THE
      PROGRAM FROM LOCKING UP
110 'THIS HAPPENS WHEN THE LAST
      LINE LISTED IS HIGHER THAN
      THE HIGHEST LINE OF THE NEW
      PROGRAM
120 'IF YOU FORGET AND IT LOCKS
      UP, JUST HIT THE RESET AND
      TYPE LIST AND <ENTER>

130 CLS
140 TM=PEEK(39)*256+PEEK(40)
150 CLEAR 200, TM-240
160 TM=PEEK(39)*256+PEEK(40)
170 FOR X=TM TO TM+223
180 READ A
190 POKE X, A
200 NEXT X
210 EXEC TM
220 P=PEEK(25)*256+PEEK(26)
230 POKE P, 0: POKE P+1, 0
240 POKE &H2B, 0: POKE &H2C, 0
250 DATA 49, 141, 0, 220, 190, 1, 107,
175, 164, 48, 141, 0, 36, 191, 1, 107, 49
, 141, 0
260 DATA 214, 190, 1, 104, 175, 164, 4
8, 141, 0, 4, 191, 1, 104, 57, 129, 94, 38
, 8, 111
270 DATA 130, 90, 134, 1, 50, 98, 57, 1
10, 157, 0, 185, 52, 119, 51, 141, 0, 169
, 129
280 DATA 1, 39, 20, 129, 10, 38, 10, 14
1, 26, 236, 70, 221, 43, 174, 72, 141, 12
2, 53, 119
290 DATA 110, 157, 0, 145, 141, 10, 23
6, 66, 221, 43, 174, 68, 141, 106, 32, 23
8, 158
300 DATA 25, 236, 132, 38, 4, 50, 98, 3
2, 228, 220, 43, 39, 60, 16, 131, 255, 25
5, 39, 54
310 DATA 237, 66, 175, 68, 16, 174, 13
2, 16, 174, 164, 38, 5, 237, 70, 175, 72,
57, 16
320 DATA 163, 2, 39, 14, 52, 6, 236, 2,
237, 66, 53, 6, 175, 68, 174, 132, 32, 23
7, 16
330 DATA 174, 132, 16, 174, 164, 39, 2
, 174, 132, 236, 2, 237, 70, 175, 72, 32,
218, 236
340 DATA 2, 237, 70, 175, 72, 237, 66,
175, 68, 16, 174, 132, 16, 174, 164, 39,
200, 175
350 DATA 68, 236, 2, 237, 66, 174, 132
, 38, 238, 32, 188, 52, 16, 189, 189, 204
, 189
360 DATA 185, 172, 53, 16, 189, 183, 1
94, 206, 2, 221, 166, 192, 39, 5, 189, 18
5, 177, 32, 247, 189, 185, 92, 57

```


TALKHEAD FOR THE 'REAL TALKER'

"Way beyond anything you have ever seen for the CoCo"

That's a strong statement, we know. But wait until you see 'TALKHEAD'! It's a dazzling creation—easily the most impressive display of CoCo graphics you can buy!

If you have a 'REAL TALKER' voice synthesizer, DO NOT deprive yourself of this absolutely incredible Talking Head simulation program! TALKHEAD uses the 'Real Talker' and extremely high speed/high resolution machine language to create an audio-visual simulation that clearly goes way, way beyond anything that you have ever seen on ANY home computer!

TALKHEAD's fast, smooth-talking animation is so stunningly life-like that it resembles a movie more than a cartoon! This page shows some still shots of the actual moving image as it will appear on your TV screen.

And, TALKHEAD is a real snap to use in Basic, thanks to a new command that we give you: SAY. Type SAY "ANYTHING YOU WANT" and Talkhead instantly appears and speaks ANY text—it has an unlimited vocabulary!

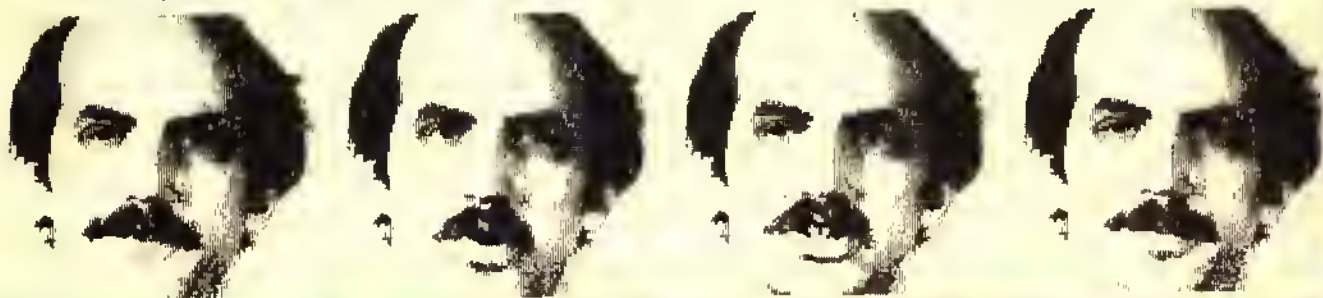
The most impressive CoCo program you can buy . . .

'TALKHEAD' is available on cassette or disk (please specify) for **only \$29.95**. The cassette version can be transferred to disk in case you ever upgrade. TALKHEAD requires 64K of memory and a Colorware 'REAL TALKER' voice pak.

PROGRAM BY TIM JENISON

SPEECH PROGRAMMING BY H. PUNYON

ONLY \$29⁹⁵ FROM COLORWARE



'TALKHEAD's eyes, mouth and jaw move, realistically animating his speech. The effect is amazing!

MORE SOFTWARE FOR THE 'REAL TALKER' VOICE PAK

STELLAR SEARCH ADVENTURE

If you ever had an urge to command the USS Enterprise, this talking version of 'STELLAR SEARCH' from Owl-Ware is for you! It uniquely combines the best aspects of 'adventure' and graphic 'action' type games and puts the 'Real Talker' voice pak to good use. You'll find graphics galore in this exciting package containing more than 86K of action adventure. Requires 32K and a 'Real Talker' voice pak. **Cassette....\$24.95. Disk....\$26.95**

TALKING EDUCATIONAL SOFTWARE

SOFTWARE FOR CHILDREN FROM COMPUTER ISLAND

Math Drill \$ 9.95
Foreign Languages..... \$ 9.95
Spelling Tester \$ 9.95

All 3 for Only \$24.95
Requires 16K and a Colorware 'Real Talker' voice pak.

ADVENTURE STARTER

The popular 'ADVENTURE STARTER' from Owl's Nest Software is now available in a speaking version for the 'Real Talker' voice synthesizer. Adventure Starter is a painless and enjoyable way to learn about computer adventure games. Included are two adventures. The first is "MYHOUSE", an easy game with plenty of help and hints. A second adventure, 'PIRATES', is more challenging. Both are great fun for the adventure minded. This is the only way to get into CoCo adventuring! Requires 16K Extended Basic and a 'REAL TALKER' voice pak. **Cassette, only \$17.95.**

COLORWARE

COLORWARE INC.
78-03 Jamaica Ave.
Woodhaven, NY 11421
(212) 647-2864



★ ★ ★ ORDERING INFORMATION ★ ★ ★

ADD \$2.00 PER ORDER FOR SHIPPING & HANDLING.
C.O.D.'S: ADD \$1.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS \$4.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.
ALL SOFTWARE ON THIS PAGE REQUIRES A
COLORWARE 'REAL TALKER' VOICE PAK.

THE TOP 4 COCO GAMES...



CUBIX

By Spectral Associates. Very much like the arcade smash! Jump little Cubix around the 3D maze trying to change the color of all the squares. With Death Globes, Discs, Snakes, etc. 32K Tape: \$24.95

ZAKSUND

From Elite Software comes this fantastic arcade style space action game with 3 different stages of moving 3-D graphics. You've never seen anything like this on your CoCo! Great sound too! 32K Tape: \$24.95



THE KING

Previously called 'Donkey King', you simply cannot buy a more impressive game for your CoCo. With 4 different screens and loads of fun! From Tom Mix Software. 32K Tape: \$25.95

GHOST GOBBLER

From Spectral Assoc. This "PAC" theme game has been improved several times. It is definitely the best of its type. Brilliant color, action and sound, just like an arcade. 16K Tape: \$24.95



COLORCADE SUPER JOYSTICK MODULE

WITH
RAPID
FIRE!

ONLY \$19.95

JOYSTICK INTERFACE/RAPID FIRE/6 FT. EXTENDER ALL IN ONE! The Colorcade allows connection of any Atari type joystick to your CoCo including the Wico Red Ball. These switch type sticks are extremely rugged and have a faster and more positive response. They will improve the play of almost any action game.

An adjustable speed rapid fire circuit is built in. Press your fire button and get a great burst of fire instead of just a single shot! You get a real advantage in shooting games that do not have repeat fire.

ATARI JOYSTICK

ONLY
\$8.50

THE BEST YOU
CAN BUY
WICO #15-9730

~~\$34.95~~
\$29.95

WICO FAMOUS
"RED BALL"



ROM/PROJECT/ PRODUCT CASE



Give a professional look to your project or product! High quality 3 piece injection molded plastic with spring loaded door. Designed especially for the CoCo ROM slot.

2 - 4 pcs. \$5.50 Ea.
5 - 9 pcs. \$3.50 Ea.
10 - 99 pcs. \$2.75 Ea.
100 & UP. Call Us.

P.C. board for 27XX EPROMS... \$4.00 Ea.

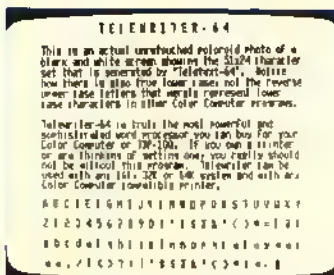
COLORWARE LIGHT PEN



ONLY \$19.95
WITH SIX FREE
PROGRAMS ON
CASSETTE!

The Colorware Light Pen plugs directly into your joystick port and comes with six fun & useful programs on cassette. Easy instructions show how to use it with Basic and it's compatible with light pen software such as Computer Island's "Fun Pack." Order yours today. Only \$19.95 complete.

TELEWRITER-64



DISK \$59.95
CASSETTE... \$49.95

Colorware researched the word processors available for the Color Computer. This is the best. Telewriter-64 is a truly sophisticated system that is marvelously easy to use. It works with any 16K, 32K or 64K system and any CoCo compatible printer.

TOP-RATED COCO WORD PROCESSOR

COLORWARE



TOLL FREE ORDERING
800-221-0916

ORDERS ONLY, N.Y. & INFO CALL (212) 647-2864

'REAL TALKER'

HARDWARE Voice Synthesizer

**NEW from
COLORWARE..
only... \$59.95**

**THINKING OF BUYING A
COCO VOICE SYNTHESIZER?
READ THIS....**

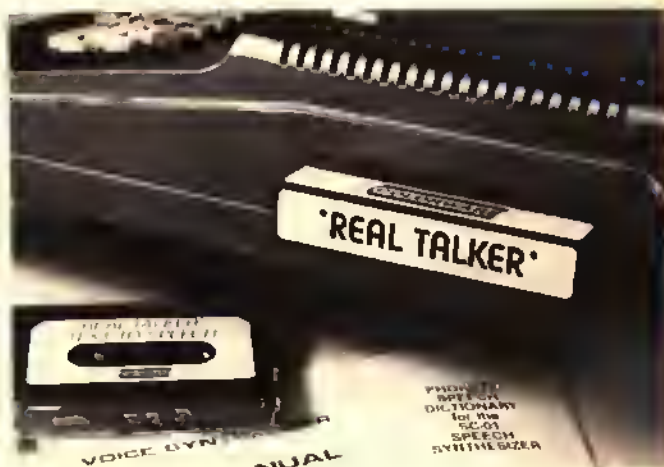
Making your computer talk couldn't be any easier! 'Real Talker' is a full featured, ready to use, HARDWARE voice synthesizer system in a cartridge pak. It uses the Votrax SC-01 phoneme synthesizer chip to produce a clear, crisp voice.

FREE TEXT-TO-SPEECH

Included free with 'Real Talker' is Colorware's remarkable Text-to-Speech program. This is a truly powerful machine language utility. What it does is automatically convert plain English to speech. And it has an unlimited vocabulary! For example, use it in the direct mode: Type in a sentence or a paragraph, even mix in numbers, dollar signs, etc., then press enter. The text is spoken. At the same time a phoneme string is generated which can be saved to cassette or disk, modified or used in a Basic program.

We originally planned to sell this major piece of programming for about \$40.00 but decided it was so useful that no 'Real Talker' user should be without it. Besides, it really shows off the capability of 'Real Talker'.

Also included with 'Real Talker' is our unique Phoneme Editor program. It allows you to explore and create artificial speech at the phoneme level. Phonemes are the fundamental sounds or building blocks of word pronunciation. There are 64 different phonemes, as well as 4 inflection levels at your disposal. Creating and modifying speech at the phoneme level is both fascinating and educational. The Phoneme Editor may also be used to customize the pronunciation of speech produced by the Text-to-Speech program.



You don't have to use any of our utility programs though. If you write your own Basic Programs, you will find the pocket sized Votrax Dictionary (included free) is all you need to make your own Basic programs talk. This dictionary gives you quick access to the phoneme sequences used to create approximately 1400 of the most used words in the English language.

How about compatibility? 'Real Talker' is compatible with any 16K, 32K, 64K, Extended or non-extended Color Computer. It works with any cassette or disk based system, with or without the Radio Shack Multi-slot expander. No other synthesizer under \$100 can make this claim. Most other CoCo voice synthesizers require an expensive Multi-slot expander in order to work with the disk system. 'Real Talker' requires only an inexpensive Y-adaptor. This is an important consideration if you plan on adding a disk or have one already.

'Real Talker' comes completely assembled, tested and ready to use. It is powered by the CoCo and talks through your T.V. speaker so there is nothing else to add. Price includes Text-to-Speech and other programs on cassette (may be transferred to disk), User Manual and Votrax Dictionary. ONLY \$59.95

'Y-BRANCHING CABLE' For disk systems. This 40-pin, 3 connector cable allows 'Real Talker' to be used with any disk system \$29.95

YOU DECIDE....

Order yours today on our Toll-Free Order Line. If you are not delighted with your 'Real Talker' system, simply return it within 30 days for a prompt, courteous refund.

COLORWARE

COLORWARE INC.
78-03F Jamaica Ave.
Woodhaven, NY 11421
(212) 647-2864



★★★ ORDERING INFORMATION ★★★

ADD \$2.00 PER ORDER FOR SHIPPING & HANDLING.
C.O.D.'S: ADD \$3.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS \$4.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.

This intramural bulletin board will save and display messages and maybe even promote family togetherness.

File It With The Message Center

By Jim Schmidt

The Message Center is a program I wrote out of need rather than for fun. Initially, the need was a friend's, not mine. He (a CoCo owner) wanted to be sure that his messages to his teen-age children would be noticed and, hopefully, obeyed. Frequently he could not be home when his offspring arrived from school. He needed a way to leave them chores and also find out from them where they were going to be. Many times notes went unnoticed. Getting them to write him a note was akin to "cruel and unusual punishment" in their eyes.

The Message Center has changed all that for my friend. Because the kids think that using a computer to exchange messages is "tubular," they are a together family once again.

Sometime later, I was recounting the above to yet another friend, and a strange look came over him. He listened patiently, and as the last phoneme passed my lips he

(Jim Schmidt is a senior system analyst by profession. He specializes in financial/business systems development. In his spare time, he writes articles and programs for publication using CoCo.)

asked if the program could be used in a small office.

I thought a bit and replied that it could, but I had better add a few bells and/or whistles. It came to me that essentially the program was able to "broadcast" any visual text to those in sight of it. So, why not add *SAVE/LOAD* capability so that, in addition to messages, it could also handle display chores?

The Message Center was born. Friend number two uses the program every day now. His business is real estate which causes him and his two partners to come and go quite often during the day. Whoever answers the phone will typically do this:

- 1) Call up *The Message Center* program
- 2) Load the previous messages file
- 3) Enter the current message
- 4) Save the new file with the current message

An inquiry about messages is as follows:

- 1) Call up the program
- 2) Load the message file
- 3) Key @@ to begin the display
- 4) Watch the display using P to pause it where necessary
- 5) Use M to add more messages/ replies if necessary

When he wishes to leave an urgent message, he simply keys in the message and leaves the program running in display mode. The "warble" gets the attention of the next person in the office.

He also takes his CoCo along when he has an open house. In this instance, he loads a previously saved sales pitch and runs it all day in display mode praising the property he is trying to sell.

Another use has been found for the message file by my real estate friend. He wrote a small print program to provide hardcopy of each day's message file. This printout is his follow-up tickler and allows him to inquire from the others if they have phoned so-and-so and what the results were, etc. The file produced by *The Message Center* is a plain vanilla ASCII text file with 32-byte records (strings). So there is no problem dumping it to a printer, if required. The other two partners like getting a hard-copy list of their message traffic periodically, also.

My kids have their own kids, so I can't use the program that way. I have been provided the services of a secretary whose services I share with the other

programmers and analysts on the job, so no need there. But, I *do* have a use for the program! The nature of my job is such that I am perpetually studying something — new software, schedules, evaluations, all manner of text. You guessed it! I have found that by keying into *The Message Center* the key phrases and salient points of material I am studying and then just watching the display a few times, I am better able to absorb it.

Features And Functions

To get started, key in the program and *SAVE* or *CSAVE* it. *RUN* it, and the screen prompts you to press ENTER to begin. This prompt is only to let you know that this is an "empty" program and no text resides in memory. Pressing ENTER buys you a beep and a dark screen with the word READY in the lower right corner. You are into the key entry screen which will become apparent when you key the first letter of the



"The file produced by The Message Center is a plain vanilla ASCII text file with 32-byte records (strings). So there is no problem dumping it to a printer, if required."

first line of text. Key in up to 32 characters. If you key in the full 32 characters, the line will be stored automatically. If your line ends short of 32 characters then press ENTER to store the line. Continue keying and storing lines for the duration of your message. To store a blank line (skip a line), key in a space and press ENTER. Whenever you wish to display the keyed text, key @@ in the first two positions of the line entry area. The display will begin. To return to the entry screen from the display press M. After a short time, the beep will be heard and the dark screen with the READY prompt will reappear. You can now append more messages (hence "M").

On the entry screen, note the LEFT and LINE prompts, the former will

keep track of the remaining characters in a line and the latter denotes the number of the line you are keying. A short beep will sound when you have only five characters remaining in a line. *The Message Center* can store a maximum of 100 lines of 32 characters of text. You can expand this if you like, but I don't recommend it (more on this later).

If you make an error keying a line, press the left arrow key and the line will erase allowing you to rekey it correctly. Once a line is stored, it is stored. The logic needed to allow change/delete, it turns out, is rarely required if you keep an eye on the keying. Since *The Message Center* is not a word processor, the overhead of this logic is usually extraneous. I do have a version of the program with change/delete logic installed, but it is slower and not necessary. If your particular application needs this logic, you can add it yourself or send me \$5 and I'll send you that version along with a formatted print/dump program for the text file.

You touch typists out there, be careful. A lot is going on between characters in this program and the instruction *INKEY\$* is used for key entry. So what, you say? Slow, is what! Not too slow for us two-finger types, but a tad slow for you five-finger folks. As you approach the 100 lines mark, the keying will get sluggish. Plus BASIC is doing its string thing. It is possible then to miss a letter. However, in practice, at an average of two lines per message, you would be approaching 50 messages. It would be better then to save the messages and clear the program to start a second message file. In that case, the first new message should be that there is a previous message file, and to save the current one before loading the older one.

This could be automated also. Logic to prevent a second *LOAD* without an intervening *SAVE* would be easy to implement. This is implemented in the \$5 version I mentioned earlier. Usually, it will not be needed. *Please* try to implement these and any other changes you may require yourself. After all, that's what computing is all about.

To clear memory of text, key in five asterisks in the first five positions of the entry line. You are now "empty."

The *SAVE/LOAD* functions are straightforward. While in the entry screen, key two pluses in the first two positions of the line entry area and you will then be prompted further. A *LOAD* will wipe out any text stored so far in the array, so be sure to *SAVE* first if neces-



From the programmer that brought **ZAXXON** to the Color Computer, Moreton Bay Software proudly presents **BJORK BLOCKS.**



An incredible graphic utility! Now you can design graphics just like the masters. You can even animate! User friendly. Precision drawing. Precision color selection. Fully menu driven. Only one joystick needed for menu selection and graphic creation. Compressed data storage or load and save 6K binary files. Almost impossible to crash. Create your own graphic adventure screens. Limitless applications in communication, education and program development. Read the October review by *Rainbow's* Technical Editor.

Pictures created
with Bjork Blocks



Requires 32K Extended Basic
(64K for animation)

\$34.95 Tape or Disk

SPECIAL: Bjork Blocks and Graphicom \$55.00

DOUBLE DRIVER

The BEST monitor driver available. Color composite, monochrome and audio output. For original CoCo D, E and F boards. \$24.95



Mono II for Color Computer 2. An excellent monochrome monitor driver that has audio output also. \$24.95. **Specify model needed.**

64K UPGRADES



Pretested.
Guaranteed.

Instantly access 64K via M/L totally solderless kit to upgrade E Boards. Kit includes eight 4164 prime chips and chips U29 and U11 already soldered. E Board Kit \$69.95
Color Computer 2 kit requires soldering. \$64.95

MINI MOUTH

Add sound to your mute monitor. Hear the bells and whistles of your software again. No batteries. Solderless installation. For CoCo I D, E and F boards and CoCo 2. \$24.95



MORETON BAY SOFTWARE

A Division of Moreton Bay Laboratory

316 CASTILLO STREET
SANTA BARBARA,
CALIFORNIA 93101
(805) 962-3127



Ordering information



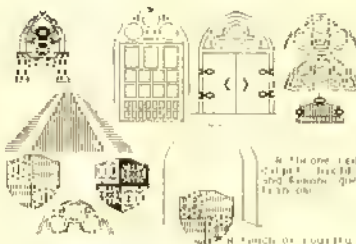
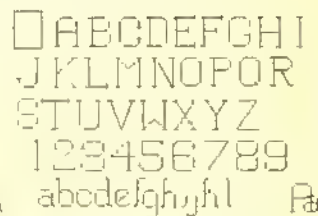
Add \$2.00 shipping and handling per order. We ship within 24 hours on receipt of order. Blue Label Service available. California residents add 6% sales tax.

GRAPHICOM

Buy Graphicom from us and get one of our unique picture disks free! Get our improved picture disk one also. Graphicom is an excellent graphic utility. See the *Rainbow* review. Requires 64K EXB, Disk Drive and Joy Sticks. **THREE** Disks and the manual for only \$29.95.

100% New Graphicom Picture Disks \$15.95

Caligraphy Stamp Set Disk



Adventure Disk I (indoor scenes and objects)

Adventure Disk II
(outdoor scenes)



MORE BUSINESS -Ver 3.12 The *preferred* business package. Completely interactive. General Ledger. Accounts Receivable. Accounts Payable. Customer Statements. Mailing Labels. Profit/Loss. Balance Sheet Statements. Our most powerful business package. Buy the best!

32K Disk R/S DOS \$99.95

*Zaxxon Reg TM Sega Corp.

**Color Computer Reg TM Tandy Corp.

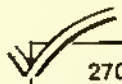
sary. After a *LOAD*, any text keyed in is added to the end of that which came in from the *LOAD*.

All that remains is to mention the *PAUSE/RESUME* functions. *PAUSE* will (surprise!) pause the display. If left

paused for a couple of minutes, it will resume the display automatically. Keying 'R' while paused will resume the display without a wait.

I would like to hear from anyone who finds unusual or interesting uses to

which they have put *The Message Center*. If you write and wish a response, please include a stamped envelope. My address is 196 Arlene Ct., Wheeling, IL 60090.



270.....	46
480.....	197
740.....	21
960.....	224
1120.....	47
END	153

The listing:

```

0  '-----
10  '--THE MESSAGE CENTER--
20  '--COPYRIGHT (C) 1983--
30  '--JIM SCHMIDT--
40  '--196A ARLENE CT.--
50  '--WHEELING, IL.  60090--
60  '-----
70  '--EXTENDED COLOR BASIC--
80  '--FOR 16K ==> PCLEAR1--
90  '-----
100 CLEAR 3800,&H3F00
110 DIMB$(100)
120 X=1:CT=0:L0=1
130 GOSUB 550
140 GOSUB780
150 SOUND150,5:GOSUB1240
160 IF X=100THEN380
170 A$=INKEY$:IFA$=""THEN170
180 IFA$<>CHR$(8)THENCT=CT+1
190 IFA$=CHR$(8)THENCT=0:CLS:L$
   ="":GOTO150
200 IFCT=27THENSOUND200,1
210 PRINT@54,"LEFT="";32-CT;
220 PRINT@86,"LINE="";X;
230 IFA$=CHR$(13)THENA$="":CLS:
   SOUND237,1:CT=32:GOTO280
240 L$=L$+A$:PRINT@0,L$
250 IF LEFT$(L$,2)="@"THEN380
260 IFLEFT$(L$,2)="++"THEN1010
270 IFLEFT$(L$,5)="*****"THEN131
   0
280 IFCT=32THENCT=0:8$(X)=L$:L$=
   "":X=X+1:CLS:SOUND237,1
290 IFX>99THEN GOSUB1280
300 PRINT@128,"    ENTER '@@' TO
   START DISPLAY"
310 PRINT@192,"    ENTER '++' TO
   SAVE THE TEXT"
320 PRINT@256,"    PRESS P TO PAUS
   E THE DISPLAY"
330 PRINT@320,"    PRESS R TO RESUM
   E THE DISPLAY"

```

```

340 PRINT@384,"    PRESS M TO ADD T
   O THE DISPLAY"
350 PRINT@448,"    PRESS LEFT ARROW
   TO ERASE LINE"
360 GOTO160
370 '--DISPLAY ROUTINE--
380 CLS:L$=""
390 FOR LO=1 TO 5:SOUND239,1:SOU
   ND240,1:NEXT
400 FOR LO=1TOX-1
410 M$=INKEY$:IF M$="M"THENCLS:
   CT=0:GOTO150
420 IF M$="P"THENGOSUB 1200
430 P$=8$(LO)
440 F=32-LEN(P$):P$=P$+STRING$(F
   ," ")
450 GOSUB640
460 NEXT
470 P$=STRING$(32," "):GOSUB640
480 FOROE=1TO2000:NEXT
490 M$=INKEY$:IFM$="P"THENGOSUB1

```

NEED AN INEXPENSIVE SERIAL-PARALLEL INTERFACE?

SP-2 INTERFACE for EPSON PRINTERS:



- 300-19,200 BAUD rates
- Fits inside printer — No AC Plugs
- Optional external switch (\$5⁰⁰ extra) frees parallel port for use with other computers
- \$49⁹⁵ (plus \$2⁰⁰ shipping)

SP-3 INTERFACE for MOST OTHER PRINTERS:

- 300-19,200 BAUD rates
- External to printer — No AC Plugs
- Built in modem/printer switch—no need for Y-cables or plugging/unplugging cables
- \$64⁵ (plus \$2⁰⁰ shipping)

Both also available for RS-232, Apple IIC and Macintosh computers.
Co Co Serial Cables 15 ft.—\$10.
Co Co/RS-232 Cables 15 ft.—\$20. Other cables on request.

**C
N
R**

P.O. Box 492
Piscataway, NJ 08854
(201) 752-0144

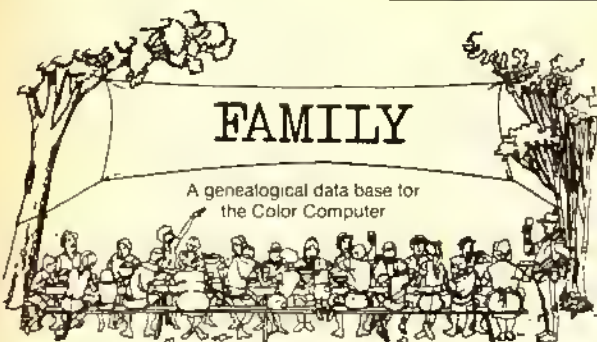
ENGINEERING

DEALER INQUIRIES INVITED!



PETROCCI FREELANCE ASSOCIATES

802-296-1041



Maintains data on 255 people in first eight generations of your family tree. Prints 3 charts; 5 generation pedigree - graphic display of lineage; Family group charts; ancestors by reference number. Easy to use.
32K EXT 14.95

GOLF HANDICAPPER

USES USGA RULES



Calculating Golf Handicaps is a complex procedure! This program makes it fast and easy! And even better, The program analyzes your game - calculates best and average score for each hole on you favorite course; calculates average scores on all Par 3, 4 & 5 holes; calculates average score for each 11 yardage increment. 24.95 32K EXT

BOWLING SECRETARY

(New Super Second Edition)

Now includes handicap routines for both men and women, pin spotting, selection of up to 15 players per team, plus the standard team standings, individual average, high and total pins, team won/lost, high series, cumulative total team points.

Printer Output & Screen Display

32K EXT - 24.95 Std. 16K Version Still Available

All Programs 16K Tape
Unless Otherwise Specified
All Programs Available on Disk - Add \$5.00
Special Sale Prices - Retail Only

Include \$1.50 for handling for each program
Arizona residents add 7% sales tax
Quantity Discounts to Dealers



PETROCCI FREELANCE ASSOCIATES

651 N. Houghton Rd.

Tucson, AZ 85748

802-296-1041



200

500 IFM\$="M" THEN CLS0:CT=0:GOTO150

510 CLS0:P=0

520 GOTO390

530 '---M/L ROUTINE TO DEAL WITH

540 ' BASIC'S NASTY SCROLL---

550 CLS0

560 DEFUSR1=&H3F00

570 FOR P=&H3F00 TO &H3F00+52

580 READ ZZ : POKE P,ZZ

590 NEXT P

600 P=0

610 RETURN

620 '---CONVERT TO GREEN ON

630 ' BLACK AND POKE TEXT---

640 IF P\$="" THEN RETURN ELSE FO
RZZ=1TOLN(P\$)

650 ZX=ASC(MID\$(P\$,ZZ,1))

660 IF ZX>63 AND ZX<128 THEN ZX=
ZX-64

670 IF P<0 OR P>511 THEN GOSUB 7
20

680 POKE P+&H400,ZX

690 P=P+1

700 NEXT ZZ

710 RETURN

720 IF P<0 THEN P=0

730 IF P>511 THEN P=480 : V=USR1
(Y)

740 RETURN

750 DATA 142,4,32,16,142,4,0,166

,0,167,32,48,1,49,33,191,63,253,

204,6,0,16,179,63,253,38,236,142

,5,224,134,32,167,0,48,1,191,63,

253,16,142

760 DATA 6,0,16,188,63,253,38,23

9,57,18,0,0,0,0

770 '---T I T L E---

780 P\$=" HELLO...":GOSUB640

790 P=32

800 P\$=STRING\$(32," "):GOSUB640

810 P=64

820 P\$=" THIS IS THE MESSAGE CE
NTER":GOSUB640

830 P=96

840 P\$=STRING\$(32," "):GOSUB640

850 P=128

860 P\$=" COPYRIGHT (C) 1983"
:GOSUB640

870 P=160

880 P\$=" JIM SCHMIDT":GOSUB6
40

890 P=192

900 P\$=" 196A ARLENE CT.":GO
SUB640

910 P=224

920 P\$=" WHEELING, IL. 60090


```

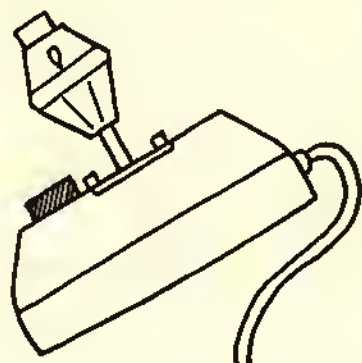
":GOSUB640
930 FORDE=1TO1000:NEXT:CLS0
940 P=288
950 P$="" PRESS <ENTER> TO BEG
IN":GOSUB640
960 A$=INKEY$:IF A$<>CHR$(13)THE
N960
970 P=0:P$=""
980 CLS0
990 '---TAPE/DISK I/O ROUTINE---
1000 RETURN
1010 CLS:PRINT@137,"TAPE OR dISK
??"
1020 SOUND234,1
1030 D$=INKEY$:IFD$<>"T"AND D$<>
"D"THEN1030
1040 IFD$="T" THEN DV=-1 ELSE DV=
1
1050 PRINT@137,"SAVE OR LOAD??"
1060 SOUND234,1
1070 D$=INKEY$:IFD$<>"S" AND D$<
>"L"THEN1070
1080 IFD$="L"THEN FT$="I" ELSE F
T$="O"
1090 PRINT:PRINT" READY
DRIVE"
1100 INPUT"FILENAME IS ";FI$
1110 IFFT$="I"THENX=1
1120 OPEN FT$,#DV,FI$

```

```

1130 IF FT$="O"THEN FORLP=1TO X-
1
1140 IF FT$="I"THENIF EOF(DV) TH
EN 1180
1150 IF FT$="O"THEN PRINT #DV,B$
(LP)ELSE LINE INPUT #DV,B$(X)
1160 IFFT$="I"THENX=X+1
1170 IFFT$="O"THEN NEXTLP ELSE G
OTO1140
1180 CLOSE#DV:CLS0:CT=0:L$="":GO
TO150
1190 '---PAUSE ROUTINE---
1200 FORDE=1TO10000
1210 N$=INKEY$:IFN$="R"THENRETUR
N
1220 NEXT:RETURN
1230 '---READY PROMPT---
1240 POKE1531,18:POKE1532,5
1250 POKE1533,1:POKE1534,4
1260 POKE1535,25:RETURN
1270 '---100 LINE LIMIT REACHED-
1280 P$="WARNING - MAX LINES IS
100":SOUND 245,10:P=480
1290 GOSUB640:RETURN
1300 '---PURGE ARRAY---
1310 CT=0:L$="":A$="":FORLL=1TOX
-1:B$(LL)="":NEXT:CLS0:X=1:GOTO1
50

```



DEPENDABLE DISK DRIVES

After you spend hours working on your computer, you want to be **SURE** all that data is in a safe and secure place. After three years of experience, we have found the safest place is a TEAC single-sided disk drive. The durability and dependability of TEAC drives are unmatched in the drive industry. Even more amazing is their small size. They are only **one-half** the size of the bulky, cumbersome drives that most people have. Combine TEAC's drives with our special dual power supply and case, and you can fit two drives in the space of one. To run these outstanding devices, we include the famous J&M disk controller with JDOS. **The bad news** - After you see our prices, you'll wonder how you ever survived without these drives before!

- 1 TEAC 54A Drive** \$289.95
Includes: Dual power supply and case (add another drive yourself)
J&M Controller with JDOS (RSDOS available)
- 2 TEAC 54A Drives** \$399.95
Includes: Dual power supply and case
J&M Controller with JDOS (RSDOS available)

TOP-QUALITY HAYES JOYSTICKS

Let your fingers fly and keep your reactions lightning-quick with a Hayes joystick. These joysticks are fully ANALOG for the finest possible control on the Color Computer. With the special set of adjusters, you can have either "spring centering" or a positive "true-positioning" mode of operation. Add to these outstanding features the superb construction that goes into every Hayes joystick. The **best part** is yet to come - **the price**. Due to a once only special from the manufacturer, we have received an unbelievable deal. Once our supplies run out, so will these spectacular prices.

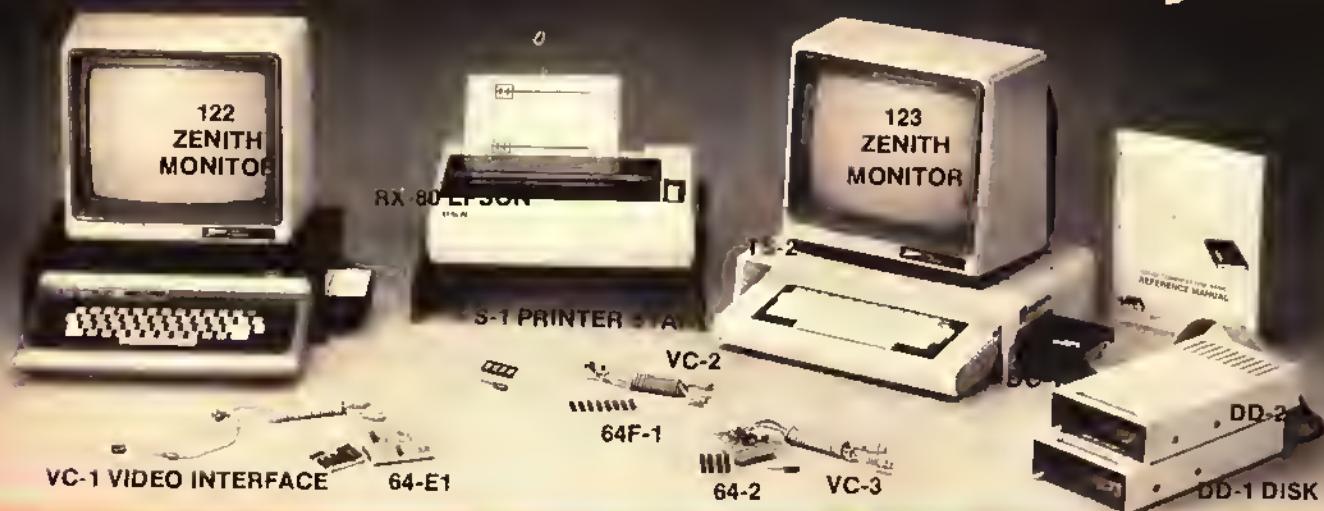
- Hayes Mach II \$24.95
Hayes Mach III (2 buttons) \$29.95

MichIron

576 South Telegraph
Pontiac, Michigan 48053
(313) 334-6576



Zenith Monitor Special ... Only \$98



ZENITH MONITORS

Our Zenith monitors offer you great quality and high resolution, and our 123 Zenith Green Screen is an outstanding value at only \$98. (Note: All monitors require video controller.)

122 Zenith 12" Amber Screen, 640 dots x 200 dots, 15 MHz resolution, **\$134** (\$6 shpg)

SPECIAL! 123 Zenith 12" Green Screen, 640 dots x 200 dots, 15 MHz resolution. Our reg. price \$114. **Now only \$98.** (\$6)

131 Zenith 13" Color Monitor with speaker, composite, RGB jack, 240 x 200 dots, 2.5 MHz resolution. **\$334** (\$9)

CONTROLLERS

DC-1 Disk Controller reads and writes to 35 and 40 track single and double sided drives with all models of the color computer. (J&M) **\$134** (\$2shpg)

VC-1 Video Interface mounts inside color computer by piggybacking IC on top of interface—no soldering, no trace cuts. All models give composite video and sound. **\$24.45** (\$2)

VC-2 for Color Computer 2—monochrome only. **\$26.45** (\$2)

VC-3 for Color Computer 2—color and monochrome. **\$39.45** (\$2)

GEMINI 10-X PRINTERS

Gemini 10X Printer. Fast, accurate 120 characters per second, 10" wide carriage, friction and pin-lead printer. Includes internal Gemini serial interface and color computer to Gemini cable.

\$318
complete
(\$6 shpg)

MEMORY 64K Upgrades

64-E1 for E Boards. Remove old chips and replace with this preassembled package—no soldering, no trace cuts. **\$68.45** (\$2)

64-F1 for F Board. Preassembled with no soldering. Capacitor leads must be cut. **\$64.45** (\$2)

64-2 for Color Computer 2. Kit requires two solder joints, no trace cuts. **\$69.45** (\$2)

Drive O Packages More storage, Less cost!

Our double-sided disk package gives you twice the storage for only \$44 more...

359,424 Bytes:
DD-2 DSDD Drive
DC-1 40 Track
Controller
CA-1 Cable

Only
\$394
\$7 shpg

Our double-sided, double-density disk and 40 track controller give you more available storage at a lower unit cost. 359,424 bytes for \$395, compared with our major competitor's 156,672 bytes for \$350—we give you twice as much storage for only \$45 more. Our system will read your old 35 track diskettes, too, and all our Howard Drive O Packages have gold-plated contacts that reduce the common disk errors due to oxidation.

...Our single-sided disk package gives 23,040 bytes more for a dollar less!

179,712 Bytes:
DD-1 SSDD Drive
DC-1 40 Track
Controller
CA-1 Cable

Only
\$349
\$7 shpg

Compare our exceptional prices on high-quality computer equipment and our unmatched 30-day full-refund warranty. Howard value makes our products sensible investments... and perfect gifts.

Our Unmatched Guarantee

We offer a 30-day full-refund guarantee. In addition, all products are covered by manufacturer warranty.

Our Unmatched Service

Charge orders and orders accompanied by money order or certified check are usually shipped within 24 hours. If you're in the Chicago area, you're welcome to stop at our warehouse at 1690 North Elston. Also... try calling our Computer Bulletin Board at (312) 278-9513.

SURGE SUPPRESSORS

SS-1 Surge Suppressor protects your data & equipment against power surges and transients. Reg. \$48 value. **Howard's low price: \$16.25** (\$6 shpg)



Howard Medical Computers

Box 2, Chicago IL 60690

RB1084

Telephone (312) 944-2444

Computer Bulletin Board (312) 278-9513

Cat.No.	Number	Desc. (inc. color)	Unit cost	Cost
			\$	\$
<input type="checkbox"/> My check or money order is enclosed <input type="checkbox"/> Bill (circle one) MC VISA AE			Total Cost	
<input type="checkbox"/> Send C.O.D.			Shipping	
Name _____ Address _____ City, State, Zip _____			Ill. res. add 8% COD (add 1.65) Total order \$	



The Biggest

The Best



The Indispensable

The RAINBOW

It's called the *premier Color Computer magazine* for good reason. **The Rainbow** is the biggest, best, brightest and most comprehensive publication a happy CoCo ever had! Is there any wonder we get letters daily which praise **the Rainbow**, the magazine one reader calls "A Pot Of Gold" for his Color Computer?

The Rainbow features more programs, more information and more in-depth treatment of the TRS-80 Color, TDP System-100, MC-10 and Dragon-32 and 64 computers than anyone else.

Each monthly issue has as many as 340 pages and contains as many as two dozen programs some 15 regular columns and 30 or more product reviews. And advertisements: **the Rainbow** is known as the medium for advertisers — which means every month it has a wealth of information unavailable anywhere else about new products! More than 200 companies advertise in its pages every month.

But what makes **the Rainbow** is its people. People like Bob Albrecht, the master teacher of computer programming. People like Don Inman, one of the world's best computer graphics authors. Experts like Dick White, one of the most knowledgeable writers about BASIC. Or, Dan Downard, **Rainbow** technical editor, who answers our readers' toughest questions. Educators like award-winning **Rainbow** columnist Steve Blyn. Advanced programmers like Dale Puckett, who guides you through Radio Shack's OS-9 operating system. Electronics specialists like Tony DiStefano, who explains the "insides" of the CoCo. These people, and many others, visit you monthly through columns available only in **the Rainbow**.

Innovative ideas, like our Scratch and Sniff Adventure or our Anniversary special "soundsheets" with recorded programs, are ready to lead right into your computer! Complete Adventure games and Simulations. **The Rainbow's** unique Scoreboard of arcade games. And games — lots of them — super graphics and utilities, the world's first four-color computer magazine center-fold! And much, much more.

Join the tens of thousands who have found **the Rainbow** to be the absolute necessity for their CoCo. With all this going for it, is it surprising that more than 95 percent of **the Rainbow** subscribers renew their subscriptions?

We're willing to bet that, a year from now, you'll be doing the same. For more information call (502) 228-4492.

Get Your Very Own Pot O' Gold!

Here's your chance to have a Pot O' Gold full of programs, articles and information about CoCo every month of the year! A subscription to **the Rainbow** is only \$28* and you won't miss a single chock-full issue.

As the premier magazine for the TRS-80 Color, TDP-100 and Dragon-32 and -64 computers, **the Rainbow** has more of everything — and greater variety, too. Do yourself and your CoCo a favor and subscribe to **the Rainbow** today!

We accept VISA, MasterCard and American Express. Non-U.S. rates higher. U.S. currency only, please.

YES! Sign me up for a year (12 issues) of the Rainbow.

☐ NEW ☐ RENEW (Attach Label)

Name _____ Address _____ City _____ State _____ Zip _____
☐ Payment Enclosed (Payment must accompany order)
 Charge ☐ VISA ☐ MasterCard ☐ American Express
 Account Number _____
 Signature _____ Card Expiration Date _____

*Subscriptions to **the Rainbow** are \$28 a year in the United States, Canadian and Mexican rates \$35 U.S. funds. Surface rate elsewhere \$65 U.S. funds. Air mail is \$100 dollars U.S. funds. All subscriptions begin with the current issue. Please allow 5-6 weeks for the first copy.



Rainbow On Tape Tops Typing

Tired of spending all your valuable computer time typing in those long, but wonderful, **Rainbow** programs each month? Now there is **Rainbow On Tape** to help ease the pain.

Each month all the lengthy programs (over 20 lines) in **the Rainbow** can come to you ready-to-run, thanks to **Rainbow On Tape**. At \$70* per year — or \$8 a tape ** — it is the biggest bargain going.

Back issues are available beginning with April, 1982. (except May 1983). Each month's tape will arrive at approximately the same time as that month's issue of **the Rainbow**.

YES! Sign me up for the biggest bargain going . . . Rainbow On Tape!

☐ NEW ☐ RENEW (Attach Label)
☐ A Full Year ☐ A Month (Specify Month & Year)

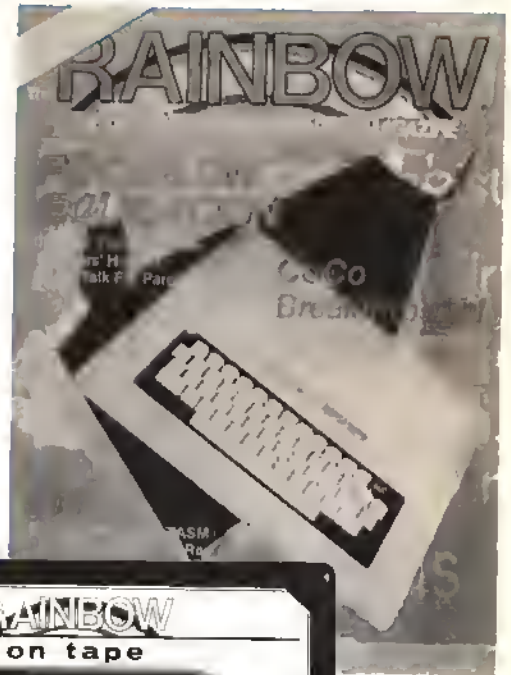
Name _____ Address _____ City _____ State _____ Zip _____
☐ Payment Enclosed (Payment must accompany order)
 Charge ☐ VISA ☐ MasterCard ☐ American Express
 Account Number _____
 Signature _____ Card Expiration Date _____

*Subscriptions to **Rainbow On Tape** are \$70 in the United States, \$80 U.S. funds in Canada and Mexico and \$95 U.S. funds in all other countries.

**Back issues of the tapes are \$8 in the United States, \$10 U.S. funds for Canada, Mexico and all other countries.



What goes well with the *Rainbow*?



Rainbow On Tape!

We call it the other side of THE RAINBOW and we may have to raise the price just to call your attention to it. With more than two dozen programs every month, *Rainbow On Tape* is a luxury service at a bargain basement price.

What is it? *Rainbow On Tape* is a monthly, cassette tape adjunct to THE RAINBOW and it's brimming with all the programs (those over 20 lines long) that fill the pages of the magazine. All you do is pop the cassette in your tape recorder and they're ready to run. No more lost weekends—or weeknights—typing, typing, typing. With *Rainbow On Tape*, you can read the article in the magazine then, in seconds, you load it up and run it.

Yes, *Rainbow On Tape* is brimming with the programs that fill THE RAINBOW's pages each month. And, yes, you could type them in yourself, as many people do. But all of them? Every month? There simply isn't enough time.

Isn't it time your CoCo became a fulltime computer instead of a typewriter. Think how your software library will grow. With your first year's subscription, you'll get almost 300 new programs: games, utilities, business programs, home applications—the full spectrum of THE RAINBOW's offerings without the specter of keying in page after page and then debugging.

Rainbow On Tape—the "meat" of THE RAINBOW at a price that's "small potatoes." Food for thought. To get your first heaping helping, just fill out and return the attached reply card. No postage necessary.

Discover the other side of THE RAINBOW. It's not only a time-saver, it's the key to a whole new outlook!

BUSINESS REPLY CARD

First Class

PERMIT No. 1

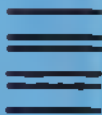
Prospect, KY

POSTAGE WILL BE PAID BY ADDRESSEE

RAINBOW

P.O. Box 385

Prospect, KY 40059



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY CARD

First Class

PERMIT No. 1

Prospect, KY

POSTAGE WILL BE PAID BY ADDRESSEE

RAINBOW

P.O. Box 385

Prospect, KY 40059



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



CASH MAN

By Bill Dunlevy & Doug Frayer

Exploding with color, racing with fast animation, and roaring with sound, this great non-violent game is destined to be a classic! The review in February's issue of RAINBOW says this: "A Fun Investment" "It is totally unique" "I found it very tough to tear myself away from playing the game long enough to write about it! In short, CASHMAN is one fun game. Buy it!"



Dozens of levels and screens (more than FORTY!) offer anyone, from beginner to expert, as much good clean fun as they want! Higher levels include special Mystery Pieces and Expert Puzzle Pieces and Expert Puzzle Screens. Play alone or go for the ultimate challenge of two-player simultaneous competition. Run along the colorful girders, jump across the tremendous chasms, climb the ropes and ladders, or grab a BYRD and fly to get the loot before your opponent does, but watch out! The KATS are on the prowl and your opponent is tossing eggs! Run, jump, climb, or fly to your nearest Color Computer and play CASHMAN!

32K - Tape \$27.95
Disk \$29.95

DEMON SEED

By Jeffery Sorenson
& Phillip MacKenzie

All alone in the silence of space, you switch on the view-port to look at the brilliant stars. And then you see THEM: a massive hoard of bat-like aliens, swarming towards you! The ship trembles under the distant explosions of enemy fire. You have only one chance for survival - Fight! As you attempt to defeat each new wave of enemy ships, they only get stronger and faster! If by some miracle you survive the first assault, you find yourself pitted against enemies so swift, powerful, and outright evil that only one name fits them - DEMONS! And it that's not enough, they bring out the heavy artillery - the Mother Ship! Engaging in battle, you see a dark cloud against the stars: another invasion fleet!



Created in the same spirit of the classic arcade games like Phoenix and Galaga, DEMON SEED is a great package of arcade fun and action. Different screens of bats, demons, and special challenge rounds keep the excitement high and the competition stiff!

32K - Tape \$27.95
Disk \$29.95

TIME BANDIT

By Bill Dunlevy & Harry Lafnear

Tired of games that only have a few screens or force you to follow strict levels? In TIME BANDIT, you virtually create your own game! You can choose from more than TWENTY places through-out the game, with more than 15 distinct variations and levels of difficulty in each place; this means over 300 variations!



Use the TIMEGATES to travel to the three different Worlds of Time, each containing a multitude of colorful and unique adventuring areas. Visit the medieval dungeons of FANTASY WORLD, recapture the days of yesteryear in WESTERN WORLD, and reach for the stars in FUTURE WORLD. Fight the Evil Guardians: the Looking Lurker, Angry Elmo, Killer Smurphs, and more! Find the Keys and escape with the treasures of time. But hurry - your power is fleeting! Crisp Supergraphics, colorful scrolling landscapes, full animation of a multitude of characters, great sound, and over THREE HUNDRED SCREENS - it's all here! The conquest of time and space awaits!

32K - Tape \$27.95
Disk \$29.95

576 S. Telegraph Road
Pontiac, Michigan 48053
Orders & Info: (313) 334-6576

Master Charge and VISA OK. Add \$3.00 for shipping in the U.S.A. - \$5.00 in Canada. Dealer inquiries invited.

MichTron



THE ROAD RACE

Here's a game that all racing fans might enjoy. All it takes is a 16K Extended Color Computer, a joystick and a little time. The rules are as follows:

Limits of Gears

Maximum speed in first gear is 25 MPH.

Maximum speed in second gear is 50 MPH.

Maximum speed in third gear is 75 MPH.

Accelerate — push stick forward (up)

Decelerate — pull back (down)

Gear Up — push stick up and press button

Gear down — push stick down and press button

Note: If HP gets over 8000, you will blow your engine.

(Shane Franklin is a 15-year-old sophomore at Marshall Sr. High School, Marshall, Texas, who became interested in computers about two years ago. After receiving his computer, he has become a "computer addict" and plans a career in this field.)

By Shane Franklin



When you load the program you will see the track and a lot of numbers. The numbers are the maximum speed for that turn. The program is a little slow, but, it takes a while for the computer to show the gear, speed and horse power. If you want the game to go faster you will have to take out the part of Line 670, which makes the sound.

Have fun, but don't blow your engine!

The listing:

```

10 POKE65495,0
20 PMODE1,1:SCREEN1,0:PCLS:RESTO
RE
30 DRAW"SB"
40 N$(1)="R2D4"
50 N$(2)="R2D2L2D2R2"
60 N$(3)="R2D2L2R2D2L2"
70 N$(4)="D2R2U2D4"
80 N$(5)="R2L2D2R2D2L2"
90 N$(6)="R2L2D4R2U2L1"
100 N$(7)="R2D4"
110 N$(8)="R2D2L2U2D4R2U2"
120 N$(9)="R2D2L2U1BD3R2U1"
130 N$(0)="R2D4L2U4"
140 G$="R2BD2L1F10L1H1U2"
150 S$="R2L2D2R2D2L2"
160 P$="R2D2L2U1D3"
170 H$="D4R2U2L1R1U2"
180 COLOR2,1
190 DRAW"BM0,2R1D4L1BM4,4R19F3D1
2R26EBR59F2D2G4L22D1L2D11R1D1R30
"
200 DRAW"F2D53G2L4H2U36H6G6D29G4
LB7H1U36E2R3F2D23F4R64E2R1E2R1E2
"
210 DRAW"U1H2L1H2L1H1L57H2U2E2RB
E1R3E1R3E1R3E1R3E1R21E3H12L7
0"
220 DRAW"BM4,BR17F3D11F1R29EBR56
D1G3L22G2D13F2R29F2D49G2H2"
230 DRAW"U36H6L4G6D29G4LB3H1U32E
1R1F1D24F3R69E2R1E2R1E3U3H3L1H2"
240 DRAW"L1H1L57H1E1R7E1R4E1R3E1
R3E1R3E1R3E1R21E3U4H12L72"
250 DRAW"BM0,60R1D4L1"
260 PAINT(4,6),2,2
270 DRAW"C4"
280 READ A,B,C
290 DRAW"BM"+STR$(A)+", "+STR$(B)
+N$(C)
300 IF B=50 AND C=5 THEN 320
310 GOTO 280
320 DRAW"C4BM46,190U7R75D7L1U6L7
3D6"
330 DRAW"U6R15D6R1U6R26D6R1U6"
340 DRAW"C4BM54,182; XG$;BM62,18

```

220..... 57
420..... 92
640..... 35
800..... 44
END 115

```

6R1"
350 DRAW"BMB4,182; XS$;BM92,1B2;
XP$;BM100,1B6R1"
360 DRAW"BM13B,1B2; XH$;BM146,1B
2; XP$;BM154,186R1"
370 DRAW"C38M16,14R1F2D1G2L1H2U1
E2"
380 DRAW"BM+0,+BR1F2D1G2L1H2U1E2
"
390 DRAW"BM+0,+BR1F2D1G2L1H2U1E2
"
400 PAINT(16,1B),2,3:PAINT(16,34
),2,3:PAINT(16,50),2,3
410 PAINT(50,180),2,4:PAINT(B2,1
B0),2,4:PAINT(13B,1B0),2,4
420 FORN=1TO3000:NEXT
430 PSET(4,6,3):COLOR3,2:S=4:X=7
5
440 FORSS=1TO3:ZZ=JOYSTK(0)
450 PAINT(16,16*SS),S,3
460 SOUNDX,15
470 J=JOYSTK(1):IF J<15 THEN 400
480 IF SS=2 THEN S=1:X=10
490 NEXTSS
500 G=1:SP=0:HP=0:TI=0
510 COLOR3,2
520 H=4:V=6
530 READ A,B,N,ST:FORX=1TON
540 P=PEEK(652B0):IFP=126 OR P=2
54 THEN 550 ELSE 5B0
550 XX=JOYSTK(0):J=JOYSTK(1):IFJ
<25 THEN G=G+1 ELSE G=G-1
560 IF G<1 THEN G=1 ELSE IFG>4 T
HEN G=4
570 SOUND20,1:IF SP<(G-1)*25 THE
N B40
580 XX=JOYSTK(0):J=JOYSTK(1):IFJ
<15 THEN SP=SP+G:GOTO600
590 IFJ>53 THEN SP=SP-(5-G)*4
600 HP=(4.5-G)*50*8P:IF HP>B000
THEN 840
610 IF HP<0 THEN HP=0
620 IF SP<0 THEN SP=0
630 TI=TI+100-SP
640 PAINT(50,1B0),2,4:PAINT(B2,1
B0),2,4:PAINT(13B,180),2,4:DRAW
"BM68,182; XN$(0);"
650 SA=INT(SP/100):SB=INT(SP/10-
SA*10):SC=INT(SP/1-SB*10-SA*100)
:HA=INT(HP/1000):HB=INT(HP/100-H
A*10):HC=INT(HP/10-HB*10-HA*100)
:HD=INT(HP/1-HC*10-HB*100-HA*100
0)
660 DRAW"BM106,1B2; XN$(SA);BM11
4,1B2; XN$(SB);BM122,1B2; XN$(SC
);BM160,1B2; XN$(HA);BM168,1B2;
XN$(HB);BM176,182; XN$(HC);BM18
4,182; XN$(HD);"
670 SOUNDHP/40+1,1:IF ST<>0 AND

```

Elite•Word™

Also Available On OS-9

THE SECOND GENERATION WORD PROCESSOR IS HERE! ELITE•WORD is a high performance, all machine language, Full Screen Editor which offers an ease-of-use that is simply incredible. ELITE•WORD has many powerful features not found in other word processors for the Color Computer. ELITE•WORD also offers a printed output flexibility that can handle your sophisticated home and business applications.

MAJOR features include:

Very easy to use • Top screen line reserved for HELP display/Command prompts • Excellent for BOTH program editing and word processing • TWO text entry modes; Insert or Exchange • Auto Key-Repeat • Smooth display scroll for easier proof reading • True Upper/Lower case display with lower case descenders • Hi-Res text "View" mode displays text exactly as it will be printed; Including text Justification, Auto Line Centering, dynamic Margin changes, Top and Bottom Margins, Page Numbering, and Page Breaks • Include feature (disk only) permits including several file names within one output document; total document will have sequential page numbering if desired • Fast Disk I/O; no loading of overlay files to slow down operation • Variable Text (Mail Merge) capability for Form Letter generation

32K Extended Basic Required for ROM routine calls • Variable TAB stops • User definable Headers and Footers • Smooth cursor movement over text, in any direction (including vertical) • Page Forward or Backward through text • Jump to beginning or end of text • Automatic text centering • Automatic text Word-Wrap if desired • True Block text Move, Delete, or Copy • Delete entire screen line • Backspace and Delete Character • Delete character above cursor • Find a string of characters • Global Replace character string • Two Hi-Res screen displays; 32 x 19 for text entry/editing, 64 x 19 for formatted text viewing • Continuous Memory display • Over 22K file size in 64K machines • Easy generation of ASCII files • Save/Load text files (in ASCII if desired) • Program remembers last File Name loaded or saved, and will write to it by default if desired • All I/O errors trapped and recoverable • Disk commands for Change Drive, Directory and Free Space • Print Format features allow user to specify Left Margin, Line Length, Line Spacing, Top and Bottom Margin, Duplicate Copies, Right-Side text Justification, Page Pause, Page Numbering, and more • Dynamically change any print Format features within text • Imbed Hex codes and printer Font changes within text.

Additional OS-9 version features:

Edit two files simultaneously • Save or Print only a portion of the text buffer • Edit files larger than memory (uses disk as buffer) • Block Copy from one file to another • Execute any OS-9 command from Editor

OS-9 is a trademark of Microware and Motorola.

— Shipping from stock NOW

— Dealer Inquiries Invited

Add \$2 Postage & Handling

PA residents add 6% sales tax

THE BEST FOR ONLY

Specify

Tape	\$69.95
RS Disk	\$69.95
OS-9 Disk	\$79.95
OS-9 & RS Disk	\$119.95



Elite•Spel™

This program cannot spell AARDVARK or SALUBRIOUS or VICHYSSOISE, but it is very easy to use and it's FAST! All potentially misspelled words are identified in a single pass through it's 24,000 word dictionary. ELITE•SPEL is fully compatible with ELITE•WORD and supplements the best word processor for the Color Computer. By the way, if you often use the word AARDVARK, ELITE•SPEL can learn it and up to 4,000 other words that are in your common vocabulary. Dictionary maintenance for adding and deleting words is included as an integral part of the program, not as separate programs.

MAJOR features include:

Easy to use, menu commands • Single pass dictionary search • 1,000 word memory dictionary of common words • 20,000 word dictionary included • Room for 4,000 of your own words • List suspect words on screen or printer • List all words used with number of occurrences • Learn individual words that were correct in file • Learn entire files of words • Delete words from dictionary • Apply corrections to file in batch or interactive modes • Works in single or multiple drive systems • All machine language for maximum speed • 32K disk required.

• Disk Only
• Shipping NOW
• Add \$2 Shipping
• PA residents add 6% sales tax
• Dealer inquiries invited

\$29.95



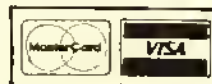
When bought with ELITE•WORD ONLY \$15.00

Elite Software

Productive Programs for Serious Users

All software features:

- ★ Superior Ease of Use
- ★ Cross-file Compatibility
- ★ Printer Compatibility
- ★ Comprehensive Manual
- ★ Nationwide User-group Support
- ★ Handsome Vinyl Binder
- ★ Revision Upgrade Program



• Shipping from stock NOW •

Add \$2.00 Shipping (\$2.50 for Elite•File)

PA Residents add 6% Sales Tax

Dealer Inquiries Invited

Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492

"Elite•Word is a terrific word processor with an impressive list of features, yet it's easy to learn and use."

—Stuart Hawkinson, HOT COCO

"I was more than satisfied with Elite•Word... After the review, I would not hesitate to compare it with the two best selling word processors. And my comparison places it at the top of the list."

—A. Buddy Hogan, RAINBOW

Elite-File™

THIS IS IT! ELITE•FILE is the Data Base Manager that Color Computer users have been waiting for. **ELITE•FILE** is for everyone who needs to store and retrieve information. **ELITE•FILE** is a full-featured relational Data Base Manager with all the editing and report formatting features that are typically found on much larger computer systems. Compare record structure flexibility, total record capacity, information processing ability, speed of program response, printed output flexibility, and you'll agree that **ELITE•FILE** may very well be the most powerful/usable program ever written for the Color Computer.

MAJOR features Include:

All machine language for speed • Flexible, user defined, data record structures • Up to 255 characters per record field • Up to 255 fields per record • Up to 2000 characters per record • Up to 4000 records per file • Up to 16 files can be open at the same time for information processing • Edit, Scan, Sort, Select Record Information; all done **FAST** • Output reports to Screen, Printer, or ASCII Disk file • Piece output data by Field Name, with Custom Text anywhere on the printed page • Perform math operations (+, -, *, /) between field contents • Produce tabulated reports from multiple record contents • Generate column totals across record field contents.

Compatible with Elite•Calc and Elite•Word files • User friendly combination of Menu driven input, and single key commands • Supports up to 4 drives • Minimum 32K RAM, Disk required • Nested sub-field definitions • Up to 8 fields in Primary Key • Copy record definition from file to file • View/Print record definition • Input/Add records with easy to use field name format display • Edit records with full screen "type over" editor • Copy records to repeat identical data • Load Elite•Calc worksheets into random access data files • Scan mode for quick data retrieval • Locate any record by field contents • Select specific groups of records by field content with full logic combination capabilities • Sort records in ascending or descending order by any field, or group of fields • Calculate values from combinations of field contents • Output any subset of fields in any order for printed reports • User selectable print formats: Page Title, Top and Bottom Margin, Line Spacing, Page Length, Page Pause, Form Feeds and more • Output format also supports TAB, VTAB, CR, PAGE, text, HEX printer controls, and more • Join up to four sub-files to extend data record for printing • Produced detailed repetitive reports, for output on preprinted forms, using output formats written on Elite•Word • Variable Text Insert feature of Elite•Word is fully supported • Refile old record data into NEW record structures • Data, Field Definitions, Indices all stored on a single file • Memory resident, no program overlays from disk • Single program performs all features • List disk Directories and "Kill" files without leaving the program • Data files also accessible from BASIC programs.



- Disk Only
- Shipping NOW
- Add \$2.50 Shipping
- PA residents add 6% sales tax
- Dealer inquiries invited

THE BEST FOR ONLY

\$74⁵⁰

Elite-Calc™

ELITE•CALC is a powerful, full featured worksheet calculator designed especially for the Color Computer. Answer "what if" questions, prepare reports, maintain records and perform other tasks that, until now, required sophisticated business computers. **ELITE•CALC** is a serious tool for those who want to do more than play games.

MAJOR features Include:

Easy of use • Individual cell formulae • Copy Blocks of cells • Full cell-edit capability • Easy 132 column page width • Changeable Bead rates • Graph format for bar charts • Sort (ascending or descending) • Sample worksheets included.

Single character commands • Help displays • 255 maximum rows • 255 maximum columns • Available memory always displayed • Rapid Entry modes for text and data • Selectable, automatic, cursor movement • Insert, Delete, Move entire rows or columns • Replicate one cell to fill a row or column with selectable formula adjustment • All machine language for speed • Extended BASIC required for ROM routine calls • Automatic memory size detection for 16K, 32K, or 64K • >20K bytes storage available in 32K systems • Math operators: +, -, x, /, [,], (,) • Relation operators: =, >, <, <=, >=, <> • Logic Operations: AND, OR, NOT • Conditional Formula: IF, THEN, ELSE • Trig Functions: SIN, COS, TAN, ATN • Log Functions: LOG, EXP, SQR • Misc. Functions: INT, FX, ABS, SGN, RND • Range Functions: SUM, AVERAGE, COUNT, MIN, MAX, LOOKUP • Definable constant table • User definable printer set-up commands • Individual column width settings • Adjustable row height to insert blank lines without wasting memory • Hide columns or rows • Alternate print font selectable on a cell by cell basis • Display/Print formats set by cell, row, or column • Dollar format, comma grouping, prefix or postfix sign • Scientific notation, fixed point and integer formats • Left and Right cell contents justification • Full page formatting • All formats stored with worksheet on disk (tape) • Save/Load Disk (tape) files in compact memory form • Scan disk directories • Output ASCII file for word processor input capability • Memory resident code ... no repeated disk calls.



THE BEST FOR ONLY

\$69⁹⁵

Specify: Disk or Tape
— Shipping from stock NOW
— Dealer Inquiries Invited
Add \$2 Postage & Handling
PA residents add 6% sales tax

"Elite•Calc is a great spreadsheet program! This professional quality program has the performance required for serious home applications as well as small businesses."

—Stuart Hawkinson, RAINBOW

"Truly one of the best programs I have seen."

—John Steiner, MICRO

"Elite•Calc is an extremely powerful worksheet..."

—Jack Lane, COLOR MICRO JOURNAL

"Bruce Cook's Elite•Calc is a very fine program indeed; potentially one of the great Color Computer Programs." "... a very impressive product."

—Scott L. Norman, HOT COCO



Enter the exciting world of graphics for the Color Computer. The first monthly graphics disk magazine for the Color Computer is here.

Just insert GRAFX into your disk drive and view the pictures with music!! You won't need Graphicom to view the pictures but all pix files can easily be transferred to a GC disk with our SHRINX 2.0 utility.

GRAFX gives you a variety of works by the great Graphicom masters-humorous pix-seasonal designs-technical designs and more...

CHARTER MEMBER OFFER

One year subscription to GRAFX \$99.95

second year's subscription \$50.00

2 year subscription=\$149.95 (Save \$\$)

DUBIOUS?? get a trial 3 month subscription for only \$30 and if we convince you we'll credit \$30 to the above offer.

TRY ONE!!! Sample Disk \$13.95*

SHRINX 2.0

SHRINX-our original utility for shrinking your pix has grown into a super utility. This is the only utility you'll need to do anything with your GC pix.

FEATURES: 1 to 4 drives, enlarge or shrink (quad-frame), variable shrink (0-100%), get or transfer to a GC disk, load or write a binary pix file, directory of any drive, user friendly menu!!!

REQUIRES 32k, 1 disk drive \$29.95*

MUSX

We've done it!! the first monthly music disk for your Color Computer. Plays 4 completely different voices at one time--sounds terrific!!

MUSX DISK #1 (contains 8-10 pop songs) \$13.95*

YOUR ONE STOP FOR ALL GRAPHICOM NEEDS!!!!

GRAPHICOM

The big hit of every RAINBOWFEST. Graphicom is simply stated the best graphics and animation utility for the COCO yet. Easy graphic menu.

REQUIRES 64K, 1 drive, joysticks \$24.95*

GRAPHICOM PIX DISKS

ART DISK #1

ART DISK #2

each \$19.95*

AID DISK #1

all for \$39.95*

FONT DISK #1

HAM SOFTWARE by John Yurek (K3PGP)

Software being used world-wide by ham operators. CW-turns your TRS-80 4K machine into a CW keyboard and CW receive terminal.

MODEL 1, MODEL 3 or COCO \$44.95* (tape only)

RY-turns a TRS-80 4K machine into a 5 level (Baudot Code) teletype machine.

MODEL 1, MODEL 3 or COCO \$49.95* (tape only)

*add \$2.00 for postage & handling

To place your order send check or money order to:

GRAFX

P.O. Box 254

West Mifflin, PA 15122-0254

VOICE LINE-(412) 466-6974 (6-9 pm)

24 HR BBS-(412)744-2335 (COCONET)

Send \$2.00 for our complete listing of available software (deductable on your order).

ARTISTS

Send a stamped self-addressed envelope for details on how to get your artworks published in GRAFX.

GRAPHICOM - TM of Cheshire Cat Computer Creations

TRS-80 COLOR COMPUTER - TM of Tandy Corporation

SP>ST THEN 870

680 PRESET (H,V):H=H+A*2:V=V+B*2:

PSET (H,V,3):NEXTX:IFH=4 AND V=64

THEN 740 ELSE 530

690 RETURN

700 PRINT:PRINT"WANT TO PLAY AGAIN?"

710 A\$=INKEY\$:IF A\$=""THEN 710

720 IF A\$="Y" THEN 20

730 END

740 CLS:PRINT:PRINT"C O N G R A D U L A T I O N S !"

750 PRINT:PRINT"YOU FINISHED THE COURSE."

760 PRINT"YOUR TIME WAS: ";TI*.10

0

770 GOTO700

780 DATA 88,18,7,96,18,0,236,8,4

,244,8,5,156,28,6,164,28,5,184,4

8,6,192,48,5,238,48,6,246,48,5

790 DATA 232,178,4,240,178,5,212

,70,6,220,70,0,210,154,7,218,154

,0,18,168,6,26,168,0,0,88,4,8,88

,5,46,132,7,54,132,0

800 DATA 160,128,6,168,128,5,48,

96,4,56,96,0,84,86,9,92,86,0,176

,86,5,184,86,0,140,50,7,148,50,5

810 DATA1,0,18,0,1,1,3,65,0,1,11

,0,1,1,1,60,1,0,27,0,1,-1,8,70,1

,0,57,0,1,1,2,45,-1,1,4,45,-1,0,

21,0,-1,1,1,65,-1,0,1,65,-1,1,1,

65,0,1,11,0,1,1,2,65,1,0,29,0,1,

1,2,65,0,1,51,0,-1,1,2,45,-1,0,2

,45,-1,-1,2,45,0,-1,36,0

820 DATA-1,-1,6,60,-1,0,2,60,-1,

1,6,60,0,1,29,0,-1,1,4,70,-1,0,8

5,0,-1,-1,1,60,0,-1,34,0,1,-1,2,

45,1,0,1,45,1,1,2,45,0,1,23,0,1,

1,4,70,1,0,65,0,1,-1,2,65,1,0,1,

65,1,-1,2,65,1,0,1,65,1,0,1,65,1

, -1,3,65,0,-1,1,65,-1,-1,3,65,-1

,0,1,65,-1,-1,2,65,-1,0,1

830 DATA65,-1,-1,1,65,-1,0,57,0,

-1,-1,2,40,1,-1,2,40,1,0,8,0,1,-

1,1,90,1,0,3,90,1,-1,1,90,1,0,3,

90,1,-1,1,90,1,0,3,90,1,-1,1,90,

1,0,3,90,1,-1,1,90,1,0,3,90,1,-1

,1,90,1,0,21,0,1,-1,3,50,0,-1,2,

50,-1,-1,12,75,-1,0,71,0

840 CLS:PRINT:PRINT"8 0 0 0 0 M

M ! !"

850 PRINT:PRINT"YOU BLEW YOUR EN

GINE."

860 GOTO700

870 CLS:PRINT:PRINT"C R A S H !

! !"

880 PRINT:PRINT"YOU WERE GOING T

O FAST AROUND THAT TURN."

890 GOTO700

VIPTM Library



Available By Express Order At Your Local Radio Shack Store!

The Library Concept

State of the Art. Quality, Integrity, Compatibility and Affordability. Five things good software must possess. Five things that epitomize the **VIP Library**TM. Each program is the diamond of its class, true excellence. These programs are first in features, first in power, first in memory, and all are affordably priced.

State Of The Art

All **Library** programs are written in machine code specifically for the Color Computer, to work without the interference of a separate operating system such as FLEX. From this comes speed and more workspace for you. Unlike other programs for the Color Computer which are said to be 64K compatible, **VIP Library**TM programs are not limited to between 24 and 30K of workspace in 64K. **Library** programs have Memory Sense with BANK SWITCHING to fully use all 64K, thus giving up to 51K with a disk version and up to 53K with a tape version.

Easy To Use

Each **Library** program was carefully designed to be extremely easy to use. Built-in on-screen help tables are at your fingertips, as are menus of all kinds. Every effort is made to use logical, intuitive and easy-to-remember commands. The manuals have been thoughtfully prepared to cover every aspect of the program, and they have complete tutorials to get you going right away. We set the standard!

Lowercase Displays

State-of-the-Art graphics allow instant use of four display colors, and eight lowercase displays featuring descending lowercase letters. You can select from 51, 64 or 85 columns by 21 or 24 lines per screen, with wide or narrow characters in the 64 display. These screens provide a pleasant and relaxing way to perform your tasks, with as much text on the

"... PICTURE getting your instantaneous investment report over the phone, using it in your spreadsheet calculation, generating a report, and writing a memo including that report and data from your database with your word processor, and all this with VIP LibraryTM programs..."

screen as is possible. Each program is easy to learn and a joy to use. We take pride in the stringent testing done to make these programs perform flawlessly. Every feature, every convenience, sleek, simple and elegant.

Total Compatibility

All **Library** programs are compatible. Transfer and use of files between programs is easy and carefree. What's better, when you have learned one program the others will come easy. And every program is the best of its kind available.

The Library Programs

For your writing needs is the **VIP Writer**TM, and its spelling checker, the **VIP Speller**TM. For financial planning and mathematical calculations you can use the **VIP Calc**TM. To manage your information and send multiple mailings there is the **VIP Database**TM. For sending all these files to and from home or the office and for talking to your friends you can have the **VIP Terminal**TM. Finally, to fix disks to keep all your **Library** files in good repair we offer the **VIP Disk-ZAP**TM.

Mini Disk Operating System

The Disk versions each have a Mini Disk Operating System which will masterfully handle from 1 to 4 drives. It offers smooth operation for such features as the ability to read a directory, display free space on the disk, kill files, save and automatically verify files, and load, rename and append files. **Library** programs simply do not have the limitations of BASIC.

Professionalism

Each volume of the **Library** is beautifully bound in a cloth-bound, gold embossed binder, and comes with a matching slipcase to protect your investment.

The **Library** will grace your work area with the professionalism it deserves. Welcome the **VIP Library**TM into your home and office.

Radio Shack is a registered trademark of Tandy Corporation.
©1983 by Sofilaw Corporation

VIP Writer

By Tim Nelson

RATED TOPS IN RAINBOW, HOT COCO, COLOR COMPUTER MAGAZINE & COMPUTER USER

The most powerful and easy-to-use word processor is available in the showpiece and workhorse of the Library: **The VIP Writer™**. Because of its undisputed superiority over all Color Computer word processors, it was selected by Dragon Data Ltd. of England and TANO in the U.S., to be the Official Word Processor for their line of Dragon microcomputers.

The result of two years of research, the **VIP Writer™** offers every feature you could desire from a word processor. It is the most powerful, fastest, most dependable and most versatile. With the hi-res display, workspace and compatibility features built into the **Library** the **Writer** is also the most usable.

"... Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless." October 1983 "Rainbow"

"Among word processors for the CoCo, **VIP Writer** stands alone as the most versatile, most professional program available." May 1984 "Computer User"

"Word processing with **VIP Writer** is like driving a high-performance vehicle... This Ferrari of a package has more features than **Telewriter**, **Easywriter** (for the IBM PC), or **Applewriter**." October 1983 "Hot CoCo"

The **Writer** will work with you and your printer to do things you always wanted to do. Every feature of your printer can be put to use, every character set, every graphics capability at any baud rate, EVEN PROPORTIONAL SPACING. All this with simplicity and elegance. You can even automatically print multiple copies.

Although all versions feature tape save and load, the disk version provides the Mini Disk Operating System common to the whole **Library**, plus disk file linking for continuous printing.

Professional features of particular note:

- Memory-Sense with **BANK SWITCHING** to fully utilize 64K, giving not just 24 or 30K, but up to 53K of workspace with the tape version and 50K with the disk version.
- **TRUE FORMAT WINDOW** allowing you to preview the printed page ON THE SCREEN BEFORE PRINTING, showing centered lines, headers, FOOTNOTES, page breaks, page numbers, & margins in line lengths of up to 240 characters. It makes HYPHENATION a snap.
- A **TRUE EDITING WINDOW** in all 9 display modes for those extra wide reports and graphs (up to 240 columns!).
- **FREEDOM** to imbed any number of PRINTER CONTROL CODES anywhere, **EVEN WITHIN JUSTIFIED TEXT**.
- Full 4-way cursor control, sophisticated edit commands, the ability to edit any BASIC program or ASCII textfile, SEVEN DELETE FUNCTIONS, LINE INSERT, LOCATE AND CHANGE, wild card locate, up to TEN SIMULTANEOUS block manipulations, word wrap around, programmable tabs, display memory used and left, non-breakable space, and headers, footers and FOOTNOTES.
- Automatic justification, automatic pagination, automatic centering, automatic flush right, underlining, superscripts, subscripts, pause print, single-sheet pause, and print comments.
- Type-ahead, typematic key repeat and key beep for the pros, ERROR DETECTION and UNDO MISTAKE features, 3 PROGRAMMABLE functions, auto column creation, and an Instant on-screen HELP TABLE.

Radio Shack Catalog No. 90-0141

32K (Comes with tape & disk) \$69.95

VIP Writer — VIP Speller Combo comes in VIP Writer Binder.

VIP Speller™

WITH A 50,000 WORD INDEXED DICTIONARY!

By Bill Argyros

Gone are the eyestrain, boredom and fatigue from endless proof-reading. **VIP Speller™** is the fastest and most user-friendly speller for your CoCo. It can be used to correct any ASCII file — including **VIP Library™** files and files from **Scriptit™** and **Telewriter™**. It automatically checks files for words to be corrected, marked for special attention or even added to the dictionary. You can even view the word in context, with upper and lowercase. **VIP Speller™** comes with a specially edited 50,000 word dictionary which, unlike other spellers for the CoCo, is indexed for the greatest speed. The shorter your file, the quicker the checking time. And words can be added to or deleted from the dictionary or you can create one of your own. **VIP Speller™** also comes with the **Library's** mini disk operating system.

Radio Shack Catalog No. 90-0142

32K DISK ONLY \$49.95

Lowercase displays not available with this program.

Window

VIP Writer — When You Need Real Power

When you want the power of a real word machine, when you want up to 95 characters per line with your Color Computer, when you want to make your printer really move, you need **VIP Writer**.

VIP Writer is a state-of-the-art word processor for the pros. It is packed with commands, features and options, yet it's simple to learn and use. Who else gives you on-line help, and even an Undo command to undo mistakes!

A neat feature is the Freeze Window, which you see in use here. This feature allows you to view your text just as it will be printed — centered titles, page numbers, footnotes, even JUSTIFICATION for even left and right-hand margins! No more guess work. **VIP Writer** is your answer!

Print Line 1 Column 1 Line 2 Page 51

VIP Calc™

By Kevin Herrbold

You can forget the other tiny ones — The real thing is here! No other spreadsheet for the Color Computer gives you:

- 20 ROWS BY 9 COLUMNS ON THE SCREEN AT ONCE
- LOWERCASE LETTERS WITH DESCENDERS
- UP TO 16 CONCURRENT DISPLAY WINDOWS
- FLOATING-POINT MATH
- CHOICE OF SINGLE AND DOUBLE PRECISION
- WORKS WITH BASE 2, 10, AND 16 NUMBERS
- UP TO 512 COLUMNS BY 1024 ROWS
- USER DEFINABLE WORKSHEET SIZE FOR MORE MEMORY
- LOCATE FUNCTION TO FIND CHECK NUMBERS, NAMES, ETC.
- COLUMN/ROW MULTIPLE SORTS
- PROGRAMMABLE FUNCTIONS
- IMBEDDABLE PRINTER CONTROL CODES
- 21 ALTERABLE PRINT FORMAT PARAMETERS
- ON-LINE HELP TABLES
- DOES NOT REQUIRE ELEX OR BASIC

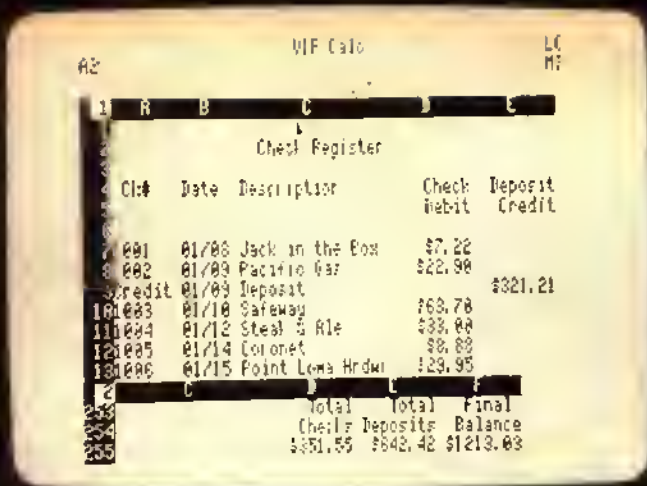
VIP Calc™ is truly the finest and easily the most powerful electronic worksheet and financial modeling program available for the Color Computer. Now every Color Computer owner has access to a calculating and planning tool better than **VisiCalc™**, containing all its features and commands and then some, WITH USABLE DISPLAYS. Use **Visicalc** templates with **VIP Calc™**!

There's nothing left out of **VIP Calc™**. Every feature you've come to rely on with **VisiCalc™** is there, and then some. You get up to 5 TIMES the screen display area of other spreadsheets for the Color Computer and Memory-Sense with **BANK SWITCHING** to give not just 24, or 30, but UP TO 33K OF WORKSPACE IN 64K!!! This display and memory allow you the FULL SIZE, USABLE WORKSHEETS you require. You also get: User definable worksheet size, up to 512 columns by 1024 rows! * Up to SIXTEEN VIDEO DISPLAY WINDOWS to compare and contrast results of changes * 16 DIGIT PRECISION * Sine, Cosine and other trigonometric functions, Averaging, Exponents, Algebraic functions, and BASE 2, B, 10 or 16 entry * Column and Row, Ascending and Descending SORTS for comparison of results * LOCATE FORMULAS OR TITLES IN CELLS * Easy entry, replication and block moving of frames * Global or Local column width control up to 78 characters width per cell * Create titles of up to 255 characters per cell * Limitless programmable functions * Typematic Key Repeat * Key Beep * Typeahead * Print up to 255 column worksheet * Prints at any baud rate from 110 to 9600 * Print formats savable along with worksheet * Enter PRINTER CONTROL CODES for customized printing with letter quality or dot matrix printer * Combine spreadsheet tables with **VIP Writer™** documents to create ledgers, projections, statistical and financial reports and budgets. Both versions feature Tape save and load, but the disk version also has the Mini Disk Operating System of the entire **Library**.

Radio Shack Catalog No. 90-0143

32K (Comes with tape & disk) \$69.95

32K does not have hi-res displays, sort or edit.



VIP Terminal™

RATED BEST IN JANUARY 1984 "RAINBOW"

By Dan Nelson

From your home or office you can join the communication revolution. The **VIP Terminal™** opens the world to you. You can monitor your investments with the Dow Jones Information Service, or broaden your horizons with The Source of CompuServe, bulletin boards, other computers, even the mainframe at work.

For your important communication needs you've got to go beyond software that only lets you chat. You need a smart terminal so that you can send and receive programs, messages, even other **VIP Library™** files. **VIP Terminal™** has "more features than communications software for CP/M, IBM and CP/M 86 computers." Herb Friedman, Radio Electronics, February 1984.

FEATURES: Choice of 8 hi-res lowercase displays * Memory-Sense with BANK SWITCHING for full use of workspace * Selectively print data at baud rates from 110 to 9600 * Full 128 character ASCII keyboard * Automatic graphic mode * Word mode (word wrap) for unbroken words * Send and receive **Library** files, Machine Language & BASIC programs * Set communications baud rate from 110 to 9600, Duplex: Half/Full/Echo, Word length: 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Lowercase masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Send up to ten short messages (KSMs), each up to 255 characters long, automatically, to save money when calling long distance.

All versions allow tape load and save of files and KSMs, but the disk version also has the Mini Disk Operating System.

Radio Shack Catalog No. 90-0139

32K (Comes with tape & disk) \$49.95

(Tape comes in 16K but without hi-res displays)

**Available
By Express Order
At Your Local
Radio Shack
Store!**

Radio Shack is a registered trademark of Tandy Corporation.

VIP Database™

"ONE OF THE BEST" JULY 1984 "RAINBOW"

By Tim Nelson

This high speed MACHINE LANGUAGE program fills all your information management needs, be they for your business or home. And it does so better than any other database program for the Color Computer, featuring machine code, lowercase screens and mailmerge capabilities. Inventory, accounts, mailing lists, family histories, you name it, the **VIP Database™** will keep track of all your data, and it will merge **VIP Writer™** files.

The **VIP Database™** features the **Library Memory Sense** with BANK SWITCHING and selectable lowercase displays for maximum utility. It will handle as many records as fit on your disk or disks. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending alphabetic or numeric order. Records can be searched for specific entries, using multiple search criteria. With database form merge you may also combine files, sort and print mailing lists, print "boiler plate" documents, address envelopes - the list is endless. The math package even performs arithmetic operations and updates other fields. Create files compatible with the **VIP Writer™** and **VIP Terminal™**. Unlimited print format and report generation with the ability to embed control codes for use with all printers.

As with all other **Library** programs, the **Database** features the powerful Mini Disk Operating System.

Radio Shack Catalog No. 90-0140

32K DISK \$59.95

64K Required for math package & mail merge

VIP Disk-ZAP™

RAVED ABOUT IN THE APRIL 1983 "RAINBOW"

By Tim Nelson

Your database file disk, form letter disk, or BASIC program disk goes bad. An I/O error stops loading, or even backing up of the disk. Weeks, even months of work sit on the disk, irretrievable. Now catastrophic disk errors are repairable, quickly and with confidence, using the **VIP Disk-ZAP™**. It is the ultimate repair utility for simple and quick repair of all disk errors. Designed with the non-programmer in mind, the **VIP Disk-ZAP™** will let you retrieve all types of bashed files, BASIC and Machine Code programs.

This high-speed machine code disk utility has a special dual cursor screen display to look at the data on your disk. You are able to: Verify or modify disk sectors at will * Type right onto the disk to change unwanted program names or prompts * Send sector contents to the printer * Search the entire disk for any grouping of characters * Copy sectors * Backup tracks or entire disks * Repair directory tracks and smashed disks * Full prompting to help you every step of the way * 50-plus page Operators Manual which teaches disk structure and repair.

Radio Shack Catalog No. 90-0144

16K DISK \$49.95

Lowercase displays not available with this program.



To Order Direct



1-800-328-2737

Order Status and Software Questions call (805)968-4364

MAIL ORDERS: \$3.00 U.S. Shipping per product (\$5.00 CANADA; \$10.00 OVERSEAS). Personal checks allow 3 weeks.

SoftLaw

132 Aero Camino 805/968-4364
Goleta, California 93117 U.S.A.

TRS-80 is a trademark of Tandy Corp, VisiCalc is a trademark of VisiCorp.

©1983 by SoftLaw Corporation



RAINBOARD

By Lane Lester

Are you the SYSOP of a RainBoard? Have you called a RainBoard yet? Do you know what a RainBoard is? Last November's issue of THE RAINBOW was also a data communications issue, and I was pleased to present a set of programs to enable you to run your own bulletin board system. The RainBoard provides not only the usual functions such as message exchange, text files to read, and programs to download; it also, in keeping with its name, provides color graphics and begins each session with a picture of a rainbow ending in a pot of gold with the message, "WELCOME TO THE RAINBOARD, WITH A RAINBOW OF COLOR AND A POT OF GOLD IN GOOD TIMES!" Also included in that same issue was Dan Downard's machine language program that interfaced my BASIC programs to the CoCo's RS-232 port.

Almost as an afterthought, I placed at the end of the article an offer of a disk with all of the programs and files needed to run your own RainBoard. The price of \$20 was what I figured would take care of the nuisance and expense of

(Lane Lester is professor of biology at Liberty Baptist College and holds the M.S. in ecology and the Ph.D. in genetics.)

printing a cover letter, copying the RainBoard disk, and mailing it. In addition to the hundreds of copies of RAINBOW ON TAPE that were sold for that issue, I have now sent out over 80 copies of the RainBoard disk, and the orders continue to come in. I have also been besieged by telephone calls from all over the United States and Canada from folks who have typed in the programs and either had problems or just want to chat about running a bulletin board. Evidently BBSing is one of the hottest new uses for personal computers.

In addition to the RainBoards scattered all over the United States, including one in Hawaii being SYSOPed by a retired longshoreman, the most colorful BBS in the world has now gone international. Somewhere in the Pacific, a U.S. Navy ship's computer users are communicating colorfully. Known RainBoards are in Canada and Australia, and not only in English-speaking countries. In August, I received a disk from Dr. Joao Araujo, Rio de Janeiro, Brazil, containing a Portuguese version. They have a 200-member CoCo club and have translated the software (the text portions — the programs are still in BASIC) for a BBS to support their club.

I think one of the major attractions of the RainBoard was that it provided a

breakthrough in the cost of starting up one's own board. In the past, prospective SYSOPs had to plan on spending several hundred dollars for an auto-answer modem, about a thousand on two or more disk drives, and over a hundred on BBS software. The RainBoard software is inexpensive (only the back-issue price of *THE RAINBOW*, if you feel like doing some typing), it only requires one drive, and auto-answer modems are now available for about \$100. [Look elsewhere in this issue for a hardware project to convert your Modem I to auto-answer.]

Has a program ever been written without bugs? Not any of mine, and *RAINBORD/BAS* was no exception. Most of the bugs were cornered before the November 1983 issue was published, but one particularly troublesome one got through. Another RainBoard SYSOP had to call it to my attention, and it was the result of my fondness for eight-character filenames. The routines that search the disks for files use *DSK1\$* to look at the directory track, and would not find any files with shorter names. So at the end of lines 1030 and 1160 one needs to add:

```
FILES = LEFT$(FILES+
  STRINGS(7,32),8)
```

to pad out the filename with as many blank spaces as needed. There are plenty of ways this could be accomplished, but I'm indebted to Mel Hefter, the genius behind Custom Software Engineering, for this elegant approach. Another bug that was corrected in a later *RAINBOW*

was a single byte in Dan Downard's *REMOTE/BIN*, which set the Band rate incorrectly in the machine language driver. The correct value at \$3F01 is \$B8, and the easiest way to handle this if you get it on a back issue of *RAINBOW ON TAPE* is to *LOADM* the program, enter *POKE &H3F01,&HB8*, and then *SAVEM* the corrected program.

"I think one of the major attractions of the RainBoard was that it provided a breakthrough in the cost of starting up one's own board."

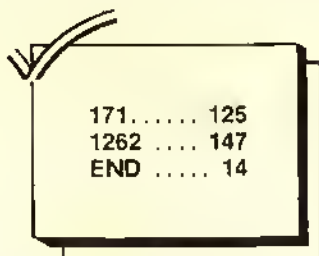
Although I did, at one time, operate a RainBoard I had to do it with my only CoCo and on a shared telephone line. So, when our town got a 24-hour BBS, I closed the RainBoard down, and have continued to enjoy BBSing as a caller of that board and others around the country. I would love to give you the phone number of our local board in hopes of communicating with some of you, but we have had a phenomenal run of bad luck with the equipment. In addition to the usual kinds of glitches, the equipment was once totally destroyed by lightning. We are also plagued by a "cracker," one of those perverts who derive pleasure from destroying other people's systems. Anyway, I'm afraid

that any number I might give you would no longer be in operation. If you would like to see a RainBoard in action, you may call either (813) 321-0397 or (412) 654-0445.

For jaded RainBoard SYSOPs, or for anyone who needs a little more encouragement, here's a new feature that can be added to the RainBoard. The original version kept the entire membership list in RAM, limiting the size. The patch (called *PATCH/BAS*) which follows provides for a direct access member file of up to 300 members. *INITMEMB/BAS* initiates the file, *EDITOR/BAS* edits the file, and *SYSOP2/BAS* replaces the original *SYSOP/BAS*. These new routines are the products of my computing colleague, Erik Gavriluk, who helped me immensely in getting the original RainBoard in shape.

In case you've decided you'd like to operate your own RainBoard, you can send \$20 to Lane Lester, 413 Woodland Circle, Lynchburg, VA 24502 for a disk containing all the programs you need, plus documentation and text files to show the kinds of things that are usually included. Alternately, if you weren't a *RAINBOW* subscriber last year, back issues of both the November 1983 magazine and the companion *RAINBOW ON TAPE* are available from *THE RAINBOW* and, together, these contain the bare necessities you need to set up your own bulletin board.

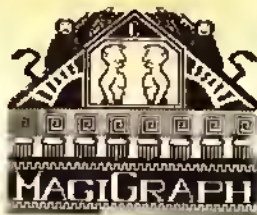
Either way, you can quickly and easily become the SYSOP of your own system.



Listing 1

```
0 * PATCH, BY ERIK GAVRILUK
1 * ENABLES RANDOM ACCESS MEMBER
  SHIP FILE FOR THE RAINBOARD.
2 * REMARK FOLLOWING THE LINE EX
  PLAINS WHAT SHOULD BE DONE,
3 *   ,E.G., CHANGED = CHANGE T
  HIS LINE TO READ...ETC.
4 * IF NOTHING ELSE IS LISTED AF
  TER A LINE, INSERT THAT LINE.
5 * THIS FILE CAN BE MERGED WITH
  THE EXISTING RAINBORD/BAS.
6 * RUN INITMEMB/BAS BEFORE USIN
```

```
G THIS NEW MODIFIED RAINBOARD.
20 GOTO 1700'CHANGED
70 CLEAR5000:DIMDISPLAY$(46),TEX
T$(70)'Modified line
100 CLS:PRINT"RAINBOARD IS READY
  TO RECEIVE!"'Replace
131 LINE INPUT"ARE YOU USING A T
RS-80 COCO (Y/N)?" :CC$:IF CC$="N
" OR CC$="n" THEN BITS=7:GOTO 15
0'Insert line
132 IF CC$="Y" OR CC$="y" THEN 1
40 ELSE 131'Insert line
170 CLOSE:PRINT"PRESS ENTER TO B
ECOME A MEMBER":LINE INPUT"OR TY
PE YOUR LOGON NUMBER:" :LN$:IF LN
$="" THEN 1500 ELSE V=VAL(LN$):I
F V<1 THEN 170 ELSE IF V>300 THE
N 170'Replace
171 OPEN"D",#1,"MEMBERS/TXT",25:
FIELD 1,16 AS NM$,6 AS PW$,3 AS
IN$:GET #1,V'INSERT
```



NEW GOOD STUFF FOR EVERY COLOR COMPUTER

Turn your Color Computer into a graphic design center with the ease of a keystroke! **MagiGraph** makes it simple to create highly detailed figures up to and including an entire high-resolution screen. Designed for those with some experience in Basic and Assembly Language programming, **MagiGraph** includes lots of special features:

- A full set of logical and pixel manipulation functions simplifies the development of complex figures.
- An editor lets you zoom in and work on every detail of your design. Toggle between the "macro" and "micro" screens for perspective on your creations.
- Nine animation buffers allow you to preview each sequence to ensure continuity and smooth flow.
- Versatile I/O routines store a graphic screen on cassette or floppy disk; recall it later for use by another program or revise it with **MagiGraph**.

If you're looking for the finest graphic development utility available for your Color Computer, THIS IS IT. Maximize your machine's potential, while you push your imagination to the limit — with **MagiGraph**!

By Kevin Dooley. Cassette **\$34.95** (16K required); Disk **\$39.95** (32K Extended Color BASIC required); Amdisk cartridge **\$44.95**.

CSPPOOL Color Computer Print Spooler

Stop Waiting Around for the Printer! **CSPPOOL** allows you to use your printer and computer concurrently, takes only 26 bytes of Color Basic's memory, and gives you 32K of print buffer. It's like having two computers in one! By intercepting characters sent to the printer and storing them in the upper 32K of RAM, **CSPPOOL** allows you to run other programs while your printer is doing its job. **CSPPOOL** is FREE with the purchase of a 64K RAM UPGRADE KIT from The Micro Works, or it may be purchased separately on cassette or diskette for **\$19.95**. Requires 64K; not for FLEX or OS9.

64K MEMORY UPGRADE KIT: For Rev. levels E, ET, NC, TOP-100s, and Color Computer II. Eight prime 64K RAM chips, instructions, and **CSPPOOL**; **\$64.95**.

SYSTEMS SOFTWARE

MACRO-80C: DISK-BASED EDITOR, ASSEMBLER AND MONITOR—With all the features the serious programmer wants, this package includes a powerful 2-pass macro assembler with conditional assembly, local labels, include files and cross referenced symbol tables. **MACRO-80C** supports the complete Motorola 6809 instruction set in standard source format. Incorporating all the features of our Rompack-based assembler (**SOS-80C**), **MACRO-80C** contains many more useful instructions and pseudo-ops which aid the programmer and add power and flexibility. The screen-oriented editor is designed for efficient and easy editing of assembly language programs. **MACRO-80C** allows global changes and moving/copying blocks of text. You can edit lines of assembly source which exceed 32 characters. **OCBUG** is a machine language monitor which allows examining and altering of memory, setting break points, etc.

Editor, assembler and monitor—along with sample programs—come on one Radio Shack compatible disk. Extensive documentation included. By Andy Phelps. **\$99.95**

SOS-80C: SOFTWARE DEVELOPMENT SYSTEM—Our famous editor, assembler and monitor in Rompack. Like **MACRO-80C**, it allows the user to write, assemble and debug assembly language programs with no reloading, object patching or other hassles. Supports full 6809 instruction set. Complete manual included. **\$89.95**

MICROTEXT: COMMUNICATIONS VIA YOUR MODEM! Now you can use your printer with your modem! Your computer can be an intelligent printing terminal. Talk to timeshare services or to other personal computers; print simultaneously through a second printer port; and re-display text stored in memory. Download text to Basic programs; dump to a cassette tape, or printer, or both. **Microtext** can be used with any printer or no printer at all. It features user-configurable duplex/parity for special applications, and can send any ASCII character. You'll find many uses for this general purpose module! **ROMPACK** includes additional serial port for printer. **\$59.95**

MICRO WORKS COLOR FORTH

- Faster to program than Basic
- Easier to learn than Assembly Language
- Executes in less time than Basic

The **MICRO WORKS COLOR FORTH** is a Rompack containing everything you need to run Forth on your Color Computer. **COLOR FORTH** consists of the standard Forth Interest Group (FIG) implementation of the language plus most of **FORTH-79**. It has a super screen editor with split screen display. Mass storage is on cassette. **COLOR FORTH** also contains a decompiler and other aids for learning the inner workings of this fascinating language. It will run on 4K, 16K, and 32K computers. And **COLOR FORTH** contains 10K of ROM, leaving your RAM for your programs! There are simple words to effectively use the Hi-Res Color Computer graphics, joysticks, and sound.

Includes a 112-page manual with a glossary of the system-specific words, a full standard FIG glossary and complete source listing.

MICRO WORKS COLOR FORTH ... THE BEST! From the leader in **FORTH**, Talbot Microsystems. **\$109.95**

MACHINE LANGUAGE

MONITOR TAPE: A cassette tape which allows you to directly access memory, I/O and registers with a formatted hex display. Great for machine language programming, debugging and learning. It can also send/receive RS232 at up to 9600 baud, including host system download/upload. 19 commands in all. Relocatable and reentrant. **CBUG TAPE: \$29.95**

MONITOR ROM: The same program as above, supplied in 2716 EPROM. This allows you to use the entire RAM space. And you don't need to reload the monitor each time you use it. The EPROM plugs into the Extended Basic ROM Socket or the Romless Pack I. **CBUG ROM: \$39.95**

SOURCE GENERATOR: This package is a disassembler which runs on the Color Computer and generates your own source listing of the BASIC interpreter ROM. Also included is a documentation package which gives useful ROM entry points, complete memory map, I/O hardware details and more. A 16K system is required for the use of this cassette. **80C Disassembler: \$49.95**

HARDWARE

PARALLEL PRINTER INTERFACE—Serial to parallel converter allows use of all standard parallel printers. **PI80C** plugs into the serial output port, leaving your Rompack slot free. You supply the printer cable. **PI80C: \$59.95**

SUPER-PRO KEYBOARD—\$69.95 (For computers manufactured after Oct. 1982, add \$4.95)

ROMLESS PACKS for your custom EPROMS — call or write for information.

BOOKS

6809 ASSEMBLY LANGUAGE PROGRAMMING, by Lance Leventhal, **\$18.95**

TRS-80 COLOR COMPUTER GRAPHICS, by Don Inman, **\$14.95**

ASSEMBLY LANGUAGE GRAPHICS FOR THE TRS-80 COLOR COMPUTER, by Don Inman, **\$14.95**

STARTING FORTH, by L. Brodie, **\$17.95**

GAMES

ZAXXON—The real thing. Excellent. What more can we say? Cassette requires 32K. **\$39.95**

STAR BLASTER—Blast your way through an asteroid field in this action-packed Hi-Res graphics game. Available in **ROMPACK**; requires 16K. **\$39.95**

PAC ATTACK—Try your hand at this challenging game by Computerware, with fantastic graphics, sound and action! Cassette requires 16K. **\$24.95**

HAYWIRE—Have fun zapping robots with this Hi-Res game by Mark Data Products. Cassette requires 16K. **\$24.95**

ADVENTURE—Black Sanctum and Calixto Island by Mark Data Products. Each cassette requires 16K. **\$19.95** each.

CAVE HUNTER—Experience vivid colors, bizarre sounds and eerie creatures as you wind your way through a cave maze in search of gold treasures. This exciting Hi-Res game by Mark Data Products requires 16K for cassette version. **\$24.95**

THE MICRO WORKS

California Residents
add 7% tax

P.O. BOX 1110-A
Del Mar, CA 92014
(619) 942-2400

Master Charge/Visa and
Diners accepted


```

172 I$=IN$:LINE INPUT"ENTER YOUR
  PASSWORD:";P$:IF P$=PW$ THEN NA
ME$=NM$:PRINT"HELLO, "NAME$" ("I
$")":GOTO 210 ELSE 170"INSERT
210 INIT$=I$:CLOSE:PRINT"CHECKIN
G FOR MESSAGES.":C=1:GOSUB650:GO
TO360"Modified line
700 MSG$="WOULD YOU LIKE"+CHR$(1
3)+"TO REPLY TO THIS (Y/N)? ":GO
SUB40:IFC$="Y"THENGOSUB740"MODIF
IEO
710 NEXTL,K:IFCD THENRETURNELSEP
RINT"SORRY, NO MESSAGES FOUNO.":
RETURN"CHANGEDO
770 PRINT"WE NEED 3 LETTERS.":GO
TO 760"CHANGEDO
810 IFLEN(S$)>8THENPRINT"8 LETTE
R MAXIMUM, "NAME$:GOTO 800"CHANG
EO
820 IFINSTR(S$,"")ORINSTR(S$,"0
")ORINSTR(S$,"/")ORINSTR(S$,".")
THENPRINT"PLEASE DO NOT USE: 0 .
: /":GOTO 800"CHANGEDO
900 PRINTSTRING$(3,7)"THAT LINE"
S TRUNCATED TO:""CHANGE
1260 PRINTTAB(6)"***THE RAINBOW
S***"CHANGEDO
1261 OPEN"D",1,"MEMBERS/TXT",25:
FIELD 1,16 AS NM$,6 AS PW$,3 AS

```

```

I$'INSERT
1262 FOR X=1 TO 300:GET #1,X:IF
PW$=STRING$(6,32) THEN CLOSE:RET
URN ELSE PRINTNM$;"("I$;")":NEX
T X:CLOSE:RETURN:"INSERT
1410 MBR=0:OPEN"O",1,"MEMBERS/TX
T:0",25:FIELD 1,16 AS NM$,6 AS P
W$,3 AS IN$:FOR X=1 TO 300:GET #
1,X:IF PW$=STRING$(6,32) THEN CL
OSE:RETURN ELSE IF I$=IN$ THEN M
BR=-1:CLOSE:RETURN ELSE NEXT:CLO
SE:RETURN
1420 NEXT:CLOSE:RETURN
1450 PCLEAR1:GOTO 70"DELETE
1500 OPEN"O",1,"MEMBERS/TXT",25:
FIELD 1,16 AS NM$,6 AS PW$,3 AS
IN$
1501 LINE INPUT"ENTER YOUR FULL
NAME:";N$
1502 LINE INPUT"ENTER 3 INITIALS
WE SHOULD ADDRESS MAIL TO:";I$:
IF LEN(I$)<>3 THEN PRINT"THREE L
ETTERS":GOTO 1502
1503 PRINT"WORKING .. PLEASE WAI
T"
1504 FOR X=1 TO 300:GET #1,X:IF
LEFT$(NM$,LEN(N$))=N$ THEN 1509
ELSE IF IN$=I$ THEN 1510 ELSE IF
PW$=STRING$(6,32) THEN 1505 EL$

```

Rainboard In Brazil

This is a photo of our Rainboard BBS setup which is on the air from 8 p.m. to 12 p.m. by phone (021) 246-2938, daily.

The system is actually made by two TEAC 80-track double density drives with a J & M disk controller, J-Cat Bell Auto-Answer modem and a 64K Color Computer ('F' Board).

We're over 30 users up today, spread all over the country, but we're hoping to increase this number a lot after this, since THE RAINBOW is the most known CoCo magazine in Brazil and is undoubtedly the CoCo user's bible all over the world.

*Joao Roberto Amin Araujo
Rua General Polidoro 288 Casa 9
Botafogo, Rio De Janeiro, 22280
Brazil*



```

E NEXT X
1505 LINE INPUT"ENTER SIX LETTER
S FOR A PASSWORD:";P$
1506 IF LEN(P$)<>6 THEN PRINT"SI
X LETTERS PLEASE":GOTO 1505
1507 LSET NM$=N$:LSET PW$=P$:LSE
T IN$=I$:PUT #1,X:CLOSE:PRINT"YO
UR LOGON NUMBER IS";X
1508 NAME$=N$:GOTO 210
1509 PRINT"SOMEONE ALREADY HAS T
HIS NAME":GOTO 1511
1510 PRINT"SOMEONE CURRENTLY HAS
THESE INITIALS"
1511 PRINT"PLEASE TRY AGAIN":GOT
O 1501
1700 PCLEAR 1:GOTO 70

```

Listing 2

```

10 ' Program to initialize rando
m access
20 ' Membership file for RAINBOR
O/BAS
30 ' BY ERIK GAVRILUK
40 CLS:PRINT"INITIALIZING MEMBER
S/TXT FILE."
50 OPEN"O",#1,"MEMBERS/TXT:0",25
60 FIELD 1,16 AS NM$,6 AS PW$,3
AS IN$
70 FOR X=1 TO 300:LSET NM$=STRIN

```

```

G$(16,32):LSET PW$=STRING$(6,32)
:PUT #1,X:NEXT X
B0 CLOSE #1
90 PRINT"FILE INITIALIZED.. YOU
HAVE ROOM FOR 300 USERS"

```

Listing 3

```

5 'EDITOR - BY ERIK GAVRILUK
10 CLS:PRINT"USERSLOG EDITOR FOR
RAINBOARO"
20 OPEN"D",#1,"MEMBERS/TXT",25:F
IELD 1,16 AS NM$,6 AS PW$,3 AS I
N$
30 REC=1
40 CLS:PRINT"RECORD #"REC:GET #1
,REC
50 PRINT"NAME:"NM$:PRINT"PASSWOR
D:"PW$:PRINT"INITIALS:"IN$
60 PRINT:PRINT"1.NAME,2.PW,3.INI
T,4.NEXT,5.END"
70 LINE INPUT A$:ON VAL(A$) GOTO
100,200,300,400,500
80 GOTO 60
100 LINE INPUT"NAME:";N$:LSET NM
$=N$:PUT #1,REC:GOTO 40
200 LINE INPUT"PASSWORD:";P$:LSE
T PW$=P$:PUT #1,REC:GOTO 40
300 LINE INPUT"INITIALS:";I$:LSE
T IN$=I$:PUT #1,REC:GOTO 40
400 REC=REC+1:GOTO 40
500 CLOSE:END

```

ORDER TOLL FREE

1-800-437-4757 EXT. 241

HERE IT IS...

The Standard BASIC Dictionary for Programming

JOHN P. STEINER

Here are all the definitions, sample commands and information on functions, statements and operations you need to quickly adapt and run a BASIC language program.

*Covers virtually ALL versions of BASIC.

*Quick reference syntax guide.

*Includes graphics & life commands.

*Each word is cross referenced to other words with identical or similar functions.

PLUS:

A complete appendix includes programming techniques, graphics, file handling, many useful charts, references and more. 230 pages in book.

ONLY

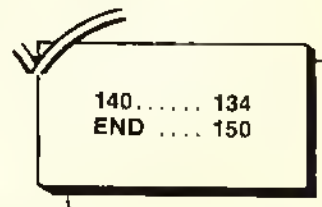
\$19.95

Plus \$2.00
Shipping & Handling

**Computer
Associates**

Dept. R
Box 663
Wheat Fargo, ND 58078

Send SASE for CoCo
Support catalog.



Listing 4

```

10 'SYSOP PROGRAM
20 CLEAR3000:OIMNAME$(50)
30 CLS:PRINT"ENTER NUMBER OF FUN
CTION:", "1. DISPLAY ACTIVITY FIL
E", "2. PRINT ACTIVITY FILE", "3.
INITIATE ACTIVITY FILE"
40 PRINT"4. DISPLAY MEMBER FILE"
,"5. PRINT MEMBER FILE", "6. STAR
T MEMBER FILE", "7. REMOVE MEMBER
S", "8. KILL OLD MESSAGES", "9. EN
D
50 INPUTK:IFK<10RK>9THEN30ELSEON
K GOSUB60,60,100,110,110,140,160
,210,250:GOTO30
60 IFK=1THENOV=0ELSEDV=-2
70 OPEN"D",1,"ACTIVITY":L=LOF(1)
:PRINT#OV,"CALLERS ="L
80 FORI=1TOL:GET#1,I:INPUT#1,ACT

```



```

$:FORJ=255TO0STEP-1:IFMID$(ACT$,
J,1)=" "THENNEXTJ ELSEACT$=LEFT$(
ACT$,J)
90 PRINT#DV,ACT$:NEXTI:CLOSE:LIN
EINPUT"PRESS ENTER TO CONTINUE";
K$:RETURN
100 KILL"ACTIVITY/DAT":RETURN
110 IFK=4THENDV=0ELSEDV=-2
120 OPEN"D",#1,"MEMBERS/TXT",25:
FIELD 1,16 AS NM$,6 AS PW$,3 AS
IN$
121 FOR I=1 TO 300:GET #1,I:IF P
W$=STRING$(6,32) THEN 130 ELSE P
RINT#DV,NM$;"(";IN$;")";" ==>";P
W$:NEXT I
130 CLOSE:LINEINPUT"PRESS ENTER
TO CONTINUE";K$:RETURN
140 CLS:LINE INPUT"SYSOP NAME:";
NA$:LINE INPUT"INITIALS:";I$:LIN
E INPUT"PASSWORD:";P$:OPEN"D",#1
,"MEMBERS/TXT",25:FIELD 1,16 AS
N$,6 AS PW$,3 AS IN$
141 LSET N$=NA$:LSET PW$=P$:LSET
IN$=I$:PUT #1,1:LSET PW$=STRING
$(6,32):PUT #1,2:CLOSE
150 RETURN
160 K=4:GOSUB110
170 LINE INPUT"ENTER INITIALS OF
MEMBER TO REMOVE, X TO RETU
RN:";I$:OPEN"D",#1,"MEMBERS/TXT",
25:FIELD 1,16 AS NM$,6 AS PW$,3
AS IN$
171 FOR X=1 TO 300:GET #1,X:IF I
N$=I$ THEN 175 ELSE NEXT X:CLOSE
:PRINT"NOT FOUND":RETURN
175 LSET PW$="....."+CHR$(255):P
UT #1,X:CLOSE:RETURN
180 WRITE#1,NUM:FORI=1TONUM:WRI
TE#1,NAME$(I):NEXT:CLOSE:RETURN
190 J=1:FORI=1TONUM:IFLEFT$(NAME
$(I),3)=INITS$THENI=I+1:NUM=NUM-
1
200 NAME$(J)=NAME$(I):J=J+1:NEXT
:GOTO170
210 'Kill Old Messages
220 CLS:PRINT"ENTER NUMBER OF CU
RRENT MONTH:":INPUTMONTH
225 FORI=3TO11:DSKI$1,17,I,A$,B$
:A$=A$+LEFT$(8$,120):FORJ=0TO7:S
BJECT$=MID$(A$,J*32+1,8):EXT$=MI
D$(A$,J*32+9,3)
230 A=ASC(SBJECT$):IFA=255THENJ=
7:I=11:GOTO240ELSEIFA=0THEN240
235 IFMID$(EXT$,2,1)="*"OR(LEFT$(
EXT$,1)="A"ANDVAL(RIGHT$(EXT$,2
))<MONTH-1)THENKILLSBJECT$+" "+E
XT$+"":1"
240 NEXTJ,I:RETURN
250 END

```

PRODUCTS FOR THE TRS-80 COLOR COMPUTER[®]

EDITRON

Full-Screen BASIC Program Editor
WILL SAVE YOU TIME!

Let EDITRON cut your programming time in half! You will appreciate the absolute ease at which this Full-Screen Editor allows you to INPUT, EDIT, and DEBUG your BASIC programs.

EDITRON performs these functions:

CURSOR-CONTROL

- * Directional Movement
- * Screen Scrolling
- * Home the Cursor
- * Limit the Cursor
- * Down Page
- * Up Page
- * Search a Line
- * Coll a Line
- * Find a String
- * Repeat Find

SCREEN-EDITING

- * Change Characters
- * Extend a Line
- * Kill a Line
- * Insert Characters
- * Delete Characters
- * Move a Line
- * Split a Line
- * Copy a Line
- * Merge Two Lines
- * Auto-Numbering

Other Features Include: Auto-repeating keys, Key Tone, user-friendly Prompts and Error Messages, and comprehensive, easy-to-read Documentation.

EDITRON is a 3K, fully position-independent Machine Language program that requires a minimum 16K of RAM, and Extended Color BASIC.

CASSETTE.....\$ 30 DISKETTE.....\$ 35

MACHINE LANGUAGE UTILITIES

FUNCTION—Gives you 10 user-definable Function keys, each can be up to 100 characters in length. (16K)

COMPRESS—Removes unnecessary spaces and unwanted remarks from your BASIC programs. (16K)

AUTO-NUM—Automatically generates sequential line numbers for easier BASIC program entry. (4K)

ROM-BOOT—Gives access to your full 64K of RAM, allowing you to use the upper 32K of memory for BASIC.

HI-BASIC—Runs your program from the upper 32K of RAM, freeing up the lower 32K for data, graphics, etc. (64K)

DISK—One for \$15, Two or more for \$10 each.

CASS.—One for \$12, Two or more for \$8 each.

HARDWARE PRODUCTS

ROMs

BASIC ROM 1.1\$45**
BASIC ROM 1.2\$35**
E.C.B. ROM 1.1\$60**
D.E.C.B. ROM 1.1\$35**

RAMs

4164—64K RAM\$0**
Set of Eight\$50**
4116—16K RAM\$1**
Set of Eight\$8**

I.C.s

6809E-1 MHz MPU ..\$25**
68809E-2 MHz MPU ..\$30**
6821—1 MHz PIA\$8**
68821—2 MHz PIA ..\$10**
6883—SAM\$25**
6847—VDG\$20**
1 MHz Set of Four ..\$65**
6822—H.D. PIA\$15**
74LS02—NOR Gate ..\$1**
74LS138—Decoder ..\$2**

SERIAL SWITCHERS

These bi-directional switchers allow you to expand your serial port to two or three peripherals or to connect one peripheral to two or three computers. They are a compact 2 x 3 x 1 1/2 inches and are available with a matched panel cut.

2 Ports\$25**
3 Ports\$30**
Add \$5** for Pilot Light

MISC

VT-8302 Pilot Light Kit\$7**
VT-8401 Cooling Fan Kit ..\$25**
6' TV Cable w/RFI Filter ..\$15**
Clip-on Heatsink, 40-Pin ..\$1**
RAM Button, 16/32/64K\$3**
IC Extractor, 16/24-Pin\$3**
Cable DIN, M/F, 4/5/6-Pin ..\$1**
Chassis DIN, F, 4/5/6-Pin ..\$2**

TERMS: Cashier's checks and money orders for immediate delivery • Personal checks allow 2 weeks • Orders over \$100 save 10% • California residents add 6% • Orders under \$25 add \$2 shipping • C.O.D. add \$4

4418 E. Chapman Ave., Suite 284
Orange, CA 92669
(714) 639-4070



VIDTRON

***FREE*
CATALOG**

CC *Talk:* A



Smart Terminal Package

By Frank Gossette



The capability of any microcomputer for communication with other computers, both large and small, can greatly enhance the power of the machine and its potential utility to the user. By connecting to a larger mainframe computer, the microcomputer user can access databases, electronic mail services, and other sophisticated resources normally beyond the capabilities of the home computer's hardware and software. *CC-Talk* is a terminal software package that can open the door to contemporary telecommunications for users of the Radio Shack TRS-80 Color Computer and the Tandy TDP-100 home computer systems.

The *CC-Talk* package contains all of the functions and features that are necessary to begin exploring telecomputing. Over normal phone lines with a modem, the user can access mainframe computers, bulletin board systems, and information services as a "dumb" terminal. The program can transmit and receive all ASCII characters and control codes in either full or half duplex operation. In addition, *CC-Talk* also provides the capability to download information from the host computer (which can be viewed off-line or saved to tape or disk), and to upload previously prepared ASCII files to the computer on the other end of the line.

The package is comprised of a BASIC language terminal driver program that can be easily modified to suit your own applications and system configuration,

and a machine language interface routine that handles the serial input/output functions and hardware interfaces. In the spirit of making telecommunications free and accessible to all, the package is yours to use, enjoy and modify for your personal use.

Using The *CC-Talk* Package

The BASIC language terminal program is shown in Listing 1. It is written in Microsoft's Extended Color BASIC and will operate on any 16K or larger machine. Without modification, the program provides for dumb terminal operation in talk mode; storing of received text to a memory buffer for online or offline viewing in download mode; transmit any ASCII file (text, data, or BASIC program) saved on tape or disk to the host computer in upload mode; and display all previously downloaded text in the memory buffer in save mode. The operating mode is selected by a single-character keypress from the prompted menu of choices displayed at the bottom of the screen.

The first step in installing the terminal package is to type in the BASIC program in Listing 1 and save it to tape or disk as "*CCT.BAS*". The program, as shown, operates on a 32K system. For users with 16K machines, change all references to hexadecimal address "*&H7xxx*" to "*&H3xxx*". The same simple modification is required for the BASIC program which loads the machine lan-

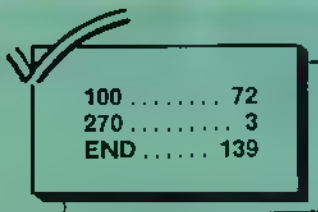
guage I/O routines (coded in *DATA* statements and *POKE*d into memory) shown in Listing 2. Simply change the *START* address from "&H7D00" to "&H3D00". After typing in the loading program from Listing 2 and checking your typing carefully, save the program

(on a different tape) as "*CCTLOAD*". It will not be used regularly once it is properly installed.

Next, *RUN* the "*CCTLOAD*" program and, after proper execution, save the machine code to tape or disk using BASIC's *CSAVEM* or *SAVEM* func-

tions under the name of "*CCT.IO*". This file should immediately follow the BASIC terminal program if you are using a tape system.

To start terminal operations, first make as much memory as possible available to the package and protect the



100	.....	72
270	.....	3
END	.....	139

Listing 1:

```

1 ' CC-TALK (C)1983 FRANK GOSSET
TE
2 ' C/O DEPARTMENT OF GEOGRAPHY
3 ' UNIVERSITY OF DELAWARE
4 ' NEWARK, DE 19711
5 '
6 ' enter> PCLEAR 1: CLEAR 500, &H
1FFF
7 ' before RUNNING the program
8 '
10 START=&H7D00 'memory address
of machine code i/o routines
20 T8UFF=&H2000 'memory address
of download buffer start
30 IF PEEK(ST)=134 THEN 40 ELSE
CLOADM "CCT.IO": REM load i/o rou
tines if not resident
40 DEFUSR1=ST ' talk-mode entry
point
50 DEFUSR2=ST+&H158' download-mo
de entry point
60 DEFUSR3=ST+&H19B' upload-mode
entry point
70 TECHO=ST+&HD7' full/half dupl
ex switch address
80 TFLG=1' 0=full duplex (default
)/ 1=half duplex
90 POKE TE,TF' set duplex switch
100 CLS:PRINT@200,"C C - T A L
K":PRINT:PRINTTAB(11)"(C) 1983":
PRINTTAB(9)"DELAGRAPHICS":PRINT
110 GOTO 250' jump to main menu
120 CLS:PRINT@4B2," talk mode : "
;TM$;:GOSUB 270:TX=USR1(0):RETUR
N
130 CLS:PRINT@482,"downloading";
TM$;:GOSUB 270:TX=USR2(T8):RETUR
N' pass download buffer address
140 CLS:PRINTTAB(8)"8UFFER CONTE
150 ' user may modify to save bu
ffer contents
160 ' to tape or disk file
170 88=T8:BE=&H7CFF' buffer star

```

```

NTS":PRINTTAB(6)"spaceMORE/enter
EXIT":PRINT
t and end addresses
180 FOR I=B8 TO BB+255
190 TC=PEEK(1):PRINT CHR$(TC);:N
EXT I
200 S1=PEEK(&H8B):S2=PEEK(&H89):
PRINT"cont";:POKE &H88,S1:POKE &
H89,S2
210 GOSUB 260:IF TK$<>CHR$(32)TH
EN 230
220 8B=B8+256:IF 88<8E THEN 180
230 ' end view buffer routine -
modify for file save
240 RETURN
250 TP$=" tALK dOWNLD uPLOAD sAV
E qUIT ":TC$="TDUS@tdusq":TM$="
<break> TO EXIT":GOTO 280
260 TK$=INKEY$:IF TK$="" THEN 26
0 ELSE RETURN
270 POKE &H88,4:POKE &H89,0:RETU
RN'reset screen position
280 PRINT@480, TP$;:GOSUB 260:TC
=INSTR(TC$,TK$):IF TC=0 THEN 280
ELSE ON TC GOSUB 120,130,320,14
0,285,120,130,320,140,285:GOTO 2
80
285 PRINT:PRINT" type CONT to
restart":STOP:RETURN
290 'user modifiable upload rout
ine here
300 'i/o routine requires BASIC
VARPTR
310 'of string to be sent to hos
t computer
320 CLS:PRINT@481,"filename>";:I
NPUT TF$:TDEV=-1:OPEN "I",TDEV,T
F$
330 PRINT@481," uploading ";TF$;
:GOSUB 270
340 IF EOF(TDEV) THEN 370 ELSE L
INE INPUT#TDEV,UP$
350 IF TFLG=1 THEN PRINT UP$ 'lo
cal echo for half duplex
360 TX=USR3(VARPTR(UP$)):GOSUB 3
B0:GOTO 340
370 CLOSE TDEV:RETURN 'end uploa
d
380 FOR TC=0 TO 255:NEXT TC:RETU
RN 'line turn-around delay
390 'end of listing

```


QUALITY SOFTWARE AND PERIPHERALS FOR YOUR COMPUTER

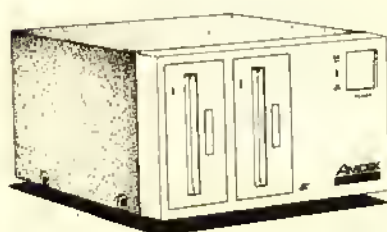
Skyline
MARKETING CORP.

HOLIDAY HARDWARE HAPPENINGS!

MONITORS

Amdex Color I Plus Price Breakthrough—\$199 (suggested retail \$379) Brilliant, vibrant, colors plus rich sound can be yours at a never-to-be-repeated price. 13" tube, non-glare, with 18 mhz bandwidth. We made a special purchase of these factory-reconditioned monitors, and guarantee that you will find them satisfactory in every way or your money back! Each unit comes with a 30 day warranty and our 10 day Money Back Guarantee. But don't wait—this offer is strictly limited, and subject to availability!

Monitor Drivers for hookup of color monitor: specify original Color Computer, \$24.95, or Color Computer 2, \$39.95



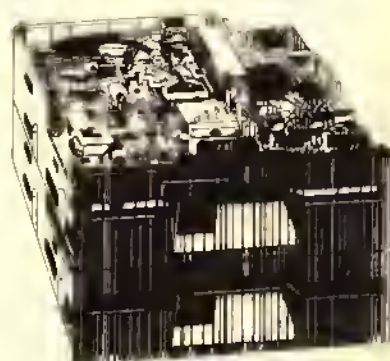
Skyline's Own Amber Hi-Res Save Big!—\$89 (suggested retail \$149) High resolution, 18 mhz, 12" non-glore amber monitor with P134 phosphor. Unmatched performance at an unheard of price! Limited supply, so order now!

Monitor Drivers for hookup of amber or green-screen monitors: specify original Color Computer or Color Computer 2, \$24.95 each.

DISK DRIVES

5¼" Double-Sided Drives like having a two-drive system, but for the price of one! Includes software (64K required) to access all 40 tracks on both sides, giving you 10 extra tracks for FREE. Ideal setup for OS-9 users. State of the art half-height drive in dual enclosure, with cable, just \$259. With controller, only \$389. For two double-sided 40 track drives in enclosure with cable, pay just \$409 (\$539 with controller).

Amdisk III B Dual 3" drives you can't say enough good things about these compact, rugged units! Now, best of all, the price is great too! These are 'flippy' drives, allowing you to use both sides of the tough, reliable, diskettes. List price was \$599—our price now is just \$379, including cable and 2 FREE diskettes! System with disk controller available for \$509.



UPS C.O.D. orders gladly accepted, \$2.00 additional.

We love Canadian orders!
Inquire for Foreign Shipping



FAST ORDER LINE (312) 286-0762
24 HOUR MODEM ORDER LINE (312) 286-9015

Ordering Information
\$10 shipping, handling and insurance on disk drives and monitors.

Skyline Marketing Corp. 4510 W. Irving Park Rd., Chicago, IL 60641

machine-code in high memory by entering:

```
PCLEAR 1: CLEAR 500, &H1FFF
```

Now, *RUN* the "CCT.BAS" program. The I/O drivers will be automatically loaded into memory if not already resident, and the menu of choices displayed.

If you are communicating with a remote computer over telephone lines, dial the computer's number and wait for the carrier signal. Enter talk mode by typing a 'T' from the menu. Then, type in whatever is required by the host computer (account number, password, etc.) in order to "sign-on." You are now functioning as a terminal as far as the other computer is concerned. You can exit talk mode by pressing the BREAK key at any point. This will not affect your connection to the host computer, but will return you to the BASIC program's menu. You can return to the talk mode or another mode from the menu as desired.

(Note: Text sent from the host while you are at the menu will, however, be lost.)

By typing a 'D' from the menu, you will enter the download mode. In this operating mode, all text sent by the host will be stored in a memory buffer in the Color Computer's memory. A reverse-video asterisk will appear on the screen for each line of text received. The actual text, however, will not appear. If you are downloading a program or data file, it is helpful to know approximately how many lines of text are in the file—as you know, the screen is 32 characters wide and you can count the "dots" to figure out when the downloading is complete. The keyboard functions normally during downloading, so you can send commands to the host to stop the listing just as in talk mode. A message will appear if the memory buffer becomes full, and in this case downloading will cease and you will be returned to the menu. The user can terminate the saving

of received text by pressing the BREAK key, which also returns you to the menu.

The save mode (typing 'S' from the menu), as implemented in Listing 1, is actually an "examine buffer contents" routine. Downloaded text is saved in a condensed format, with only valid ASCII characters (both upper- and lowercase) and the CR (Carriage Return) character for each line packed into the buffer. In save mode, the user can step through the stored text, from beginning to end, one page-full at a time. Pressing the space bar continues display of the next portion of the buffer, while hitting the ENTER key aborts the routine and returns to the menu. Since the entire terminal driver is written in BASIC, you can modify this section to actually save the buffer contents to magnetic tape or disk. A simple example of how this might be accomplished will be presented towards the end of this article.

Typing a 'U' from the menu puts you in the upload mode of the package. You

Listing 2:

```
10 'CC-TALK machine language i/o
20 'BASIC load routine
30 '
40 CLS: CLEAR 1500, &H1FFF
50 ST=&H7D00: CSUM=0
60 PRINT @40, "LOADING"
70 FOR I=0 TO 468: READ X
80 CSUM=CSUM + X
90 POKE ST+I, X
100 NEXT I
110 IF CSUM <> 48157 THEN PRINT @
224, "checksum load error--check
data": PRINT: GOTO 130
120 PRINT @228, "I/O DRIVERS INST
ALLED": PRINT: PRINT "enter:": PRIN
T: PRINT "CSAVEM 'CCT.10', &H7D00, &
H7ED4, &H7D00": PRINT
130 END
200 DATA 134, 0, 167, 141, 0, 3
0, 141, 60, 38, 4
210 DATA 141, 30, 32, 248, 109,
141, 0, 18, 38, 12
220 DATA 189, 163, 10, 129, 13,
38, 235, 23, 0, 252
230 DATA 32, 230, 141, 40, 32,
226, 0, 32, 0, 4
240 DATA 32, 42, 189, 161, 193,
```

```
39, 20, 129, 3, 38
250 DATA 13, 166, 141, 255, 237
, 129, 2, 38, 2, 53
260 DATA 2, 53, 16, 57, 23, 0,
149, 57, 23, 0
270 DATA 100, 129, 0, 57, 52, 8
4, 230, 140, 218, 238
280 DATA 140, 213, 174, 140, 20
8, 129, 32, 36, 9, 129
290 DATA 13, 38, 17, 231, 192,
239, 140, 197, 167, 128
300 DATA 175, 140, 190, 140
310 REM CHANGE THIS NEXT VALUE
TO 60 FOR 16K
320 DATA 124
330 DATA 255, 16, 39, 1, 19
340 DATA 53, 212, 142, 1, 104,
48, 31, 38, 252, 57
350 DATA 52, 23, 26, 80, 127, 2
55, 32, 141, 239, 52
360 DATA 2, 198, 8, 100, 228, 7
3, 73, 183, 255, 32
370 DATA 141, 226, 90, 38, 244,
134, 2, 183, 255, 32
380 DATA 141, 216, 141, 214, 50
, 97, 53, 151, 142, 0
390 DATA 192, 32, 3, 142, 1, 11
3, 48, 31, 38, 252
400 DATA 57, 52, 21, 26, 80, 18
2, 255, 34, 71, 37
410 DATA 31, 141, 231, 182, 255
, 34, 71, 37, 242, 79
420 DATA 52, 2, 198, 7, 141, 22
3, 182, 255, 34, 71
```




SKYLINE'S BIG 10

Chesire Cal	\$29.95
Graphicom (64K disk)	
Cognitrac	\$49.95
Telewriter 64 tape	\$59.95
Telewriter 64 disk	
Custom Software Engineering	\$ 9.95
Graphic screen print, specify printer	
Eigen Systems	\$49.95
Colorcomm E, disk or cart.	\$ 7.95
Stripper	\$ 6.95
CCEAD	\$34.95
BASIC Ard cartridge	
Micro Works	\$99.95
Macro 80C Editor Assembler	\$89.95
SDS 80C Editor Assembler	

SKYLINE'S OWN BEST SELLERS

SUPERSTATS
The most powerful statistics program available for the CoCo. Used by professionals. 16K Ext. Basic. Tape \$29.95

PAGE PLUS
Gives 64K from Basic. New revised documentation! Disk \$29.95 Tape \$27.95

STRUCTURED MACROS
Macro 80C super enhancement! Disk \$19.95

SETUP 64
Allows double-sided 40 80 track drives! \$19.95

MDISK
Sets up an internal 32K memory disk for rapid storage and retrieval. Source code included. Disk \$29.95 Tape \$27.95

ROMBACK
Why pay more? Allows dumping from ROMpak to disk or tape. Full documentation, easy to use. Lowest price! Tape \$16.95

QUICKSORT
M.L. sort routine for easy use by Basic programmers. Works on tape or disk. 16K. Tape \$12.95

64K BOOT/PAGER
This is what you need to get the most from your 64K CoCo. Super buy! 64K Req. Tape \$12.95

SIMPLEX
Programmers — this is a must! This powerful tool will save you time and effort. Min. 16K Ext. Basic. Tape \$29.95

C.C. FILE
Flexible data base manager. 16K. Now only \$12.95

C.C. WRITER
You can pay more — but will it be better? 16K. \$29.95

C.C. CALC
Powerful spreadsheet for your CoCo! 32K. \$34.95

C.C. MAILER
Handles all your mail list needs! 16K. \$19.95

C.C. Three

You save \$27.90! C.C. File, Writer, and Calc in one fantastic package. We'll even give you both tape and disk versions (one tape) for one low price — \$49.95

OUR CUSTOMERS SOUND OFF FOR SKYLINE!

I would like to express my appreciation to you for the excellent service provided by your company... I was delighted to receive my shipment only one week after the phone order. Hats off to your shipping department.

Once again, thank you for your prompt and efficient service, and for providing such a great package at a good price.

D.S., Kentucky

You might care to know that this order is repeat business. Recently, I purchased a NEC monitor package from your firm and I was very pleased with your fast service, the quality of merchandise and the ease of set-up.

M.S., California

\$60 Software Bonus With Memory Upgrade

That's right — Skyline's famous 64K Upgrade is an even better deal than before! 8 guaranteed 200 n.s. 64K memory chips, solderless installation instructions (one solder connection required on Color Computer 2), Skyline's 64K BOOT and PAGER programs. PLUS the Wizard 64 adventure game, PLUS a handy new utility, SETUP64 (allows you to configure your tape or disk system in a myriad of ways)! Still only \$59!! Order now — this offer may be withdrawn at any time!

ATTENTION ADVENTURE FREAKS!

MYSTIC MANSION



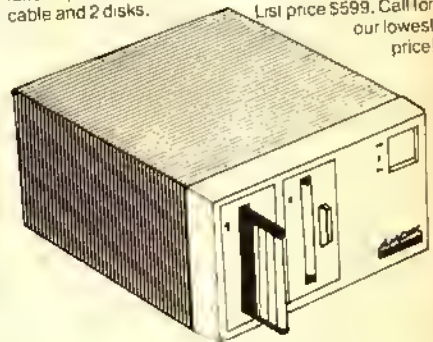
You can stay cool in front of your air conditioner, but can you keep your cool while playing Skyline's exciting ALL GRAPHIC ADVENTURE? One of the best yet! 32K Disk only. Summer Special \$29.95

HARDWARE — SKYLINE has the BEST for LESS! Call us LAST!

LESS = MORE

with the Amdek 3" Disk Drive. You get more data stored on a 3" disk than a 5 1/4" and the AMDISK III B takes up less space. AMDISK III B 3" dual drive with cable and 2 disks.

First price \$599. Call for our lowest price!



TIRED OF RF INTERFERENCE?

Poor resolution? We carry a complete line of B/W and color monitors from AMDEK, NEC and SYNCO. We also have the right monitor adapter to match your CoCo. Call for FRIENDLY SERVICE!

SKYLINE PRINTER SALE!
STAR MICRONICS — OKIDATA —
TRANSTAR — JUKI — NEC
You want it? We've got it!

GET ON LINE!

Modems from Hayes and NEC. Call for latest prices.

NOW AVAILABLE!

Skyline's Risk-Free diskettes and data cassettes — so good that they're guaranteed for as long as you own them!



"No Bull"

10 diskettes, sleeves, labels, and write protect tabs — \$19.95
12 data cassettes, boxes, and labels — \$8.00

ORDERING INFORMATION

*\$10 shipping, handling & insurance on printers, Amdisk, and monitors. \$5 on modems, \$2 on all other orders. All prices U.S. funds.

Skyline Marketing Corp. 4510 W. Irving Park Rd. Chicago, IL 60641



UPS C.O.D. order gladly accepted, \$2.00 additional.

We Love Canadian Orders!
Inquire For Foreign Shipping

FAST ORDER LINE (312) 286-0762
24-HR MODEM ORDER LINE
(312) 286-9015

FREE GIFT

Use of our order forms qualifies you for a free gift with your order. Get on our mailing list now for order forms.

COUPON

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

Dept. R

430 DATA 102, 228, 90, 38, 245,
141, 212, 53, 2, 68
440 DATA 32, 1, 79, 53, 149, 1,
52, 2, 129, 32
450 DATA 36, 46, 129, 8, 39, 42
, 129, 12, 38, 5
460 DATA 189, 169, 40, 32, 44,
129, 21, 38, 4, 134
470 DATA 127, 32, 33, 129, 10,
38, 15, 189, 161, 193
480 DATA 39, 251, 128, 64, 129,
31, 38, 18, 141, 63
490 DATA 32, 17, 129, 13, 38, 1
3, 141, 14, 109, 140
500 DATA 200, 39, 3, 189, 163,
10, 23, 255, 97, 53
510 DATA 2, 57, 52, 22, 158, 13
6, 140, 5, 160, 35
520 DATA 30, 48, 136, 192, 52,
16, 142, 4, 0, 236
530 DATA 136, 64, 237, 129, 172
, 228, 35, 247, 204, 96
540 DATA 96, 237, 129, 156, 136
, 35, 247, 53, 16, 159
550 DATA 136, 53, 150, 52, 18,
142, 63, 0, 134, 0
560 DATA 183, 255, 32, 48, 31,

38, 252, 134, 2, 183
570 DATA 255, 32, 53, 146, 189,
179, 237, 31, 1, 175
580 DATA 141, 254, 196, 142, 4,
32, 175, 141, 254, 191
590 DATA 134, 1, 167, 141, 254,
182, 22, 254, 149, 42
600 DATA 42, 66, 85, 70, 70, 69
, 82, 32, 70, 85
610 DATA 76, 76, 42, 42, 13, 48
, 140, 237, 166, 128
620 DATA 189, 163, 10, 129, 13,
38, 247, 53, 116, 57
630 DATA 23, 255, 24, 129, 0, 3
9, 3, 189, 163, 10
640 DATA 57, 189, 179, 237, 31,
1, 166, 132, 52, 2
650 DATA 238, 2, 134, 2, 167, 1
41, 254, 120, 141, 226
660 DATA 38, 252, 23, 254, 119,
141, 219, 166, 192, 23
670 DATA 254, 190, 141, 14, 106
, 228, 38, 236, 134, 13
680 DATA 23, 254, 179, 141, 201
, 53, 2, 57, 109, 141
690 DATA 255, 9, 38, 4, 141, 19
0, 39, 252, 57

will be prompted for the name of the ASCII file to be transferred. This file could be text, data or a BASIC program saved in ASCII format. The file is then read (from tape or disk) one line at a time and sent to the host as a character string. This routine can also be altered by the user. The only real requirement is that the BASIC program pass Extended Color BASIC's *VARPTR* (variable pointer) of the string variable to be uploaded to the machine language interface routine.

Uploading text files to the host computer, however, is more complicated than the other functions of the package. While downloading can be accomplished with relatively little knowledge of the computer's operating system on the other end of the connection (other than knowing how to print or list the file to the terminal), uploading requires some familiarity with the operating system of the host computer to get it to accept, save, and catalog your uploaded file. You may have to invoke an editor on the host to create a file to accept the incoming text and to save it properly. Such "housekeeping" chores should be done in talk mode, both before transfer and after the transfer is complete.

"CC-Talk is a terminal software package that can open the door to contemporary telecommunications for users of the Radio Shack TRS-80 Color Computer and the Tandy TDP-100 home computer systems."

During upload mode, the keyboard is essentially de-activated. Hitting the BREAK key (perhaps several times) will abort the upload sequence, and might also crash the BASIC program. Simply *RUN* the program again to recover (as Color BASIC does not have an *ON ERROR* function). Text already transferred to the host computer will remain intact and can be saved or deleted from talk mode.

Entering a 'Q' (for Quit) from the menu returns you to Color BASIC's command level, with the OK prompt.

While in Color BASIC, you can list the program, a disk directory, or even modify the program without affecting your modem connection (but all incoming text is lost, of course). You may return to terminal operation at any time by entering *CONT* (Color BASIC's "continue" function) or *RUN* (to restart the program).

While operating in any of the terminal modes, several of the keys are redefined to perform the special functions required of data terminals. Both upper- and lowercase letters can be sent to the host computer, with lowercase letters displayed in reverse video on the screen. The program defaults to an ALL CAPS mode which can be switched to upper/lower mode by *SHIFT [O]*, just as in Color BASIC. The down arrow key is redefined as the *CNTRL* (control) key. Special control codes required by many mainframe computers, such as "*CNTRL C*," can be sent to the host by pressing the down arrow key and then the appropriate letter. (Note: This must be capital letter if in upper-/lowercase mode.) The *SHIFT-left arrow* (backspace) combination sends the ASCII *DEL* (delete) character, which erases the current line on many mainframes. A BREAK signal or *NULL* can be sent by pressing the down arrow then the *SHIFT-up arrow*

NEW!

MUSICA 2™

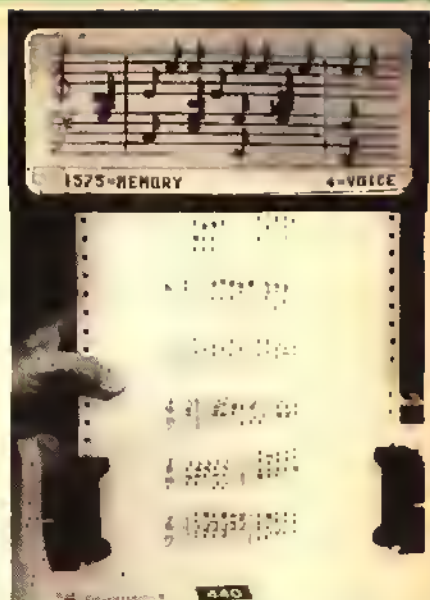
Join our MUSICA
USER'S GROUP

The best just got better.

- Dump music to any dot matrix graphics printer. (Epson, Okidata, Gemini, 10X, R.S. printers, etc.)
- Repeat any portion of music using repeat bars.
- 4 Voices produced simultaneously.
- Input notes from the keyboard or joystick.
- Develop your own timbres by specifying 9 harmonics.
- Change tempo at any point in the music any number of times.
- Save or load music from tape or disk.
- Music may be played from BASIC.
- Music produced in stereo when used with the STEREO PAK.
- 100% machine code so it is fast, no wait times.
- Volume of each of the voices may be specified separately.
- Available memory is constantly shown on screen.
- Vibrato effect possible.
- Waveshapes may be switched as the music plays.
- A 30 page manual completely describes its operation.
- Powerful music editing capabilities.
- Double bar repeat, block move and title lines supported.

Want to hear it?
Down load
music from
Compuserve.GRAPHIC
INPUTGRAPHIC
OUTPUTSTEREO
OUTPUT WITH
STEREO PAK

Tape (32K) \$34.95 Disk (32K) \$39.95

**NEW!**

STEREO PAK™

Plug this gem into your computer, connect to your home stereo system and sit back and enjoy music realism. The STEREO PAK is a hardware music synthesizer that plays our MUSIC LIBRARY and MUSICA 2 music in stereo. Because it was designed specifically with music reproduction in mind, the sound is superb. The highs are crisp and clear while the bass notes will rattle your walls.

The STEREO PAK is all hardware. It is intended as an enhancement for MUSICA 2 and our MUSIC LIBRARY. Disk owners may use the STEREO PAK with the R.S. Multi-Pak or our Y-CABLE (\$24.95).

~~\$49.95~~
39.95
 INTRODUCTORY PRICE
**NEW!**

MUSIC LIBRARY™ — 3 VOLUMES

You get over 100 four voice songs with a combined playing time of 3 hours. That's right, 3 hours of music. You won't believe your CoCo could sound so good. To fit over 100 songs required both sides of 5 C-20 tapes and the disk version uses 5 full disks (that's a half box of disks).

A JUKEBOX selection program is included to allow you to select specific songs or automatically play each. These songs are ready to go, you don't need MUSICA 2 or a knowledge of music.

These songs were developed using the best music program available for the CoCo; MUSICA 2. The tunes may be used as source files for MUSICA 2 and changed by the user. When coupled with the STEREO PAK the songs are reproduced in stereo with unsurpassed realism.

MUSIC LIBRARY 100 categories:

- | | |
|-----------------------|-------------------------|
| Stage, Screen, and TV | Classical |
| Music of the 70's | Christmas (popular) |
| Music of the 60's | Christmas (traditional) |
| Music of the 50's | Patriotic |
| Old Time Favorites | Polka Party |

MUSIC LIBRARY 200

Our second volume of 100 tunes, 3½ hours of music.

MUSIC LIBRARY 300

Our third volume of 100 tunes, 3 more hours of music.

MUSIC LIBRARY (Each Volume) ... (32K Tape) \$34.95
 (Specify 100, 200, or 300) (32K Disk) \$39.95


 Dealer Inquiries
 Invited

We accept CASH, CHECK, COO, VISA, and MASTER CARD orders.

Shipping and handling US and Canada \$3.00
 Shipping and handling outside the US and Canada \$5.00
 COO charge \$2.00
 Illinois residents add 6¼% sales tax for the STEREO PAK.

Speech Systems

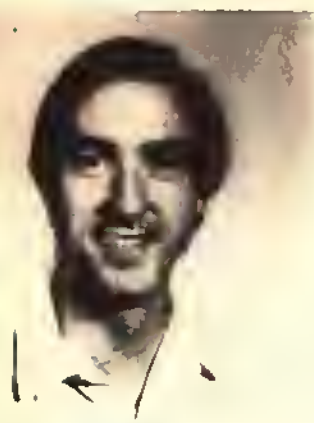
**38W255 DEERPATH ROAD
 BATAVIA, ILLINOIS 60510**
(312) 879-6880 (VOICE)
(312) 879-6811 (24 HR. BBS)

CALL ANY DAY, ANYTIME TO ORDER. ALSO ORDER BY MAIL OR BBS.

'THE VOICE'

LAST CHANCE
AT \$79.95

THE ROLLS ROYCE OF SPEECH SYNTHESIZERS



RICH PARRY
Voice Project Manager

In designing the first speech synthesizer for the Color Computer, our design goal was not to see how cheap we could make it, but how good. Perhaps we made it too good, since the original price was well over \$150.00. We managed to reduce the price to \$79.95 without effecting the quality. Unfortunately, we can't keep it at this low price forever, but we will until the end of the year. And to entice you a little, we are going to give you a FREE TALKING HEAD program and any other piece of software in our TALKING SOFTWARE LIBRARY FREE. Even TERMTALK which sells for \$49.95.

If you think we're bragging, listen to our customers.



"Let me express my thoughts about the VOICE. SUPER! GREAT! OUTSTANDING!"

Ben Burnett

"I found the VOICE is the best speech synthesizer on the market for amateurs or experts, in other words it's fantastic."

Deni Furnell

"The VOICE is really great."

Tim Rueb

"Congratulations on a really great superior product."

Leonard Hyre



FREE TRANSLATOR

A special ML "translation program" is included free which automatically converts English to speech. This program is incredible. It not only speaks anything you request, but even numbers such as \$12,234.55 are spoken in dollars and cents. In addition, an "exception table" option actually allows you to specify a particular pronunciation if you like.

Writing your own BASIC programs to use speech is a "piece of cake". Just change your PRINT statements to USR.

A very special feature allows all text that is sent to the screen to be spoken. Thus a blind person can actually write programs. You'll be amazed!

STILL UNDECIDED?

If you're not 100% satisfied after 30 days, simply return the VOICE for a complete refund.

- Only the VOICE will work in both the CoCo 1 and CoCo2 without modification.
- Only the VOICE amplifies and filters the speech to give you increased intelligibility.
- Only the VOICE gives you a volume and pitch control for added flexibility and sound effects.
- Only the VOICE has dual outputs. Listen through your TV speaker or connect to your stereo system.
- Only the VOICE is enclosed in a metal case with a black satin finish to eliminate TV interference.

WORLD'S LARGEST TALKING SOFTWARE LIBRARY

PRE-SCHOOL

- TALKING ALPHABET** A program designed to help the pre-schooler master the alphabet. \$29.95
- TALKING NUMBERS & COLORS** A must program for the very young. High Resolution graphics to insure attention and concentration. \$29.95
- TALKING NUMBER SKILLS** The child becomes familiar with the shape and meaning of numbers. \$29.95
- TALKING CLOCK** In these days of the digital clock, children miss an important education. This program aids the student in mastering the traditional analog clock. High Resolution graphics. \$29.95

GRADES 2-6

- SPELLING TESTER** A graphic spelling game. The student is shown objects to be spelled. \$9.95
- POETRY CREATOR** The VOICE speech unit is used to speak poetry that is created. \$9.95
- SHORT STORY MAKER** A program to create and speak stories created by the child. \$9.95
- FOREIGN LANGUAGE** Learn a foreign language. French dictionary is included. \$9.95
- TALKING SUBTRACTION** A program specifically designed to help the student learn subtraction. \$29.95

(GRADES 2-6 continued)

- KING AUTHOR'S TALES** A creative writing tool to allow a child to write compositions, or short stories. Q&A option is also included. \$29.95
- COLOR MATH** Addition, Subtraction, Multiplication, and Division are mastered. Student may specify difficulty level. \$24.95
- SPELL-A-TRON** Student builds a dictionary of words to be quizzed on. Perfect for Spelling B. \$24.95
- ANIMATED SENTENCES** The child builds complete sentences from a graphic menu. The action is then spoken and acted out graphically. \$24.95
- PRESIDENTS** The student is able to master the Presidents of the US. \$9.95
- STATES** A program designed to aid the student in learning correct spelling of the states. \$9.95
- CAPITALS** Learning the State's Capitals is made more interesting using speech. \$9.95
- HANGMAN** A word guessing game. You must guess the word before you hang. \$9.95
- MATH DRILL** A program to help teach arithmetic. \$9.95

ENTERTAINMENT

- FINAL COUNTDOWN** A talking adventure in which you must stop the mad general from starting WW III. \$24.95
- CAVE BEAR** A talking adventure much like the original adventure game in which you travel through caves hunting for treasure. \$29.95
- TAKING BINGO** The VOICE speech unit calls the tiles while everyone gets a chance to play. Chips and cards are included. \$24.95
- SCORE E-Z** A yahlzee type game. Up to six can play. \$24.95
- STAR TALK** You're the Star Fleet Captain, your mission, "destroy the Dragon Ships". All status reports are spoken. \$24.95
- SHIP HUNT** Play Battleship against your computer. \$24.95
- ESTHER** A ML program fashioned after ELIZA the talking psychoanalyst. An excellent example of artificial intelligence. \$24.95
- TLRM TALK** A talking terminal program. Features include:
Upload and download programs.
Full or Split Screen.
Normal or Revers Video
Control Xmit Protocols
Buffer Editing.
All this plus it speaks. TAPE \$39.95 DISK \$49.95

All software, except Termtalk, shipped on tape but may be moved to disk.

NEW!

'HOME COMMANDER' \$49.95

CAN BE USED WITH
VOICE FOR
VOCAL
ANNUNCIATION



CONTROL YOUR WORLD

Give yourself piece of mind while on vacation by programming the HOME COMMANDER to control lamps, radios, TVs and more. Or make life easy on yourself by turning on the coffee pot before you wake up. You can do this and more with the HOME COMMANDER.

NO WIRES NECESSARY

The HOME COMMANDER uses your homes existing electrical wiring to control virtually anything. Appliances are controlled via small control modules (sold separately). The LAMP DIMMER MODULE allows you to turn a lamp on or off and control 16 brightness levels. The APPLIANCE MODULE is used to control appliances up to 400 watts such as a TV, radio, stereo system, fan or motor.



ON FRIDAY 7:42 PM, OFF SUNDAY 1:26 AM

Included FREE is a program to allow you to control up to 256 devices and specify the time and date they are to be activated. That's right, the software has its own built in accurate clock.
LAMP DIMMER MODULE \$16.95 APPLIANCE MODULE \$16.95

NEW!

PRECISION TIME MODULE \$49.95



Now your computer will always know the correct time and date. This amazing precision time module is calibrated to the National Bureau of Standards (WWV) atomic clock and you should never have to change it. Use the PRECISION TIME MODULE to add the time element to your game. Or use on your BBS so that the time will always be perfectly accurate.

BATTERY BACKUP

Even when your computer is off, the clock keeps correct time by operating using the internal battery backup system.



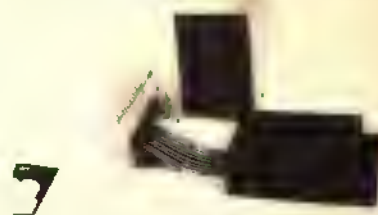
MONTHS, LEAP YEARS & DST

The PRECISION TIME MODULE automatically adjusts for the different number of days in each month as well as leap years. And believe it or not, it adjusts for DST so you don't have to remember if it's SPRING EORWARD or FALL EORWARD.

LOWEST
PRICE
ANYWHERE

Y-CABLE \$28.95

Why pay \$100 to \$200 for a multi-pak. With the Y-CABLE, you can connect your disk system to your computer along with either our STEREO PAK music synthesizer, our VOICE speech synthesizer, or our PRECISION TIME MODULE. All connectors gold plated.



NEW!

ATTENTION EXPERIMENTERS!



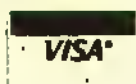
Interested in building your own project? Our oversized board gives plenty of room for construction while the sturdy aluminum case with black satin finish assures protection and a professional appearance.

Prototype Board only \$19.95
Prototype Enclosure only \$19.95

SAVE \$10
BOTH FOR
\$29.95

Need an
SC-01?
\$29.00

BLANK DISK
OR TAPE
WITH EVERY
ORDER



Dealer Inquiries
Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada \$3.00
Shipping and handling outside the US and Canada \$5.00
COD charge \$2.00
Illinois residents add 6 1/4% sales tax.

Speech Systems

38W 255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880 (VOICE)
(312) 879-6811 (24 HR. BBS)

CALL ANY DAY, ANYTIME TO ORDER. ALSO ORDER BY MAIL OR BBS.

The major advantage of writing the main terminal program in BASIC is to provide the user with a telecommunications environment that can be modified to suit his or her particular needs. As you use and modify the program to your own applications you will, no doubt, discover trade-offs and limitations that result from this decision. However, compared to many communications packages available for home computers, you may find the flexibility inherent in my approach more than makes up for its shortcomings. One can, in fact, through a careful examination of the program in Listing 1, incorporate specific terminal functions into your other programs. The possibilities for innovation are limited only by your imagination.

The actual asynchronous communications parameters used by *CC-Talk* are:

These specifications should be compatible with nearly all timesharing systems you may wish to contact, including

Terminal operations can be performed in either full or half duplex modes. In full duplex mode, all characters sent to the host computer are "echoed" by the host and then displayed on the Color Computer's screen. Half duplex or "local echo" mode, used by some systems, does not send back the character received. In this operating mode, characters are displayed on the screen before being sent out. The "duplex switch" is controlled by the variable *TFLAG* in Line 80 of program Listing 1. If the host computer you are connected to does not echo the characters as received (nothing

Technically, the Tandy Color Computers include, as standard equipment, an RS-232 serial communications interface. In reality, the "serial port" must be directly controlled by the MC6809E central processor (CPU) in software. The only use for the serial interface supported in Microsoft BASIC (in Read Only Memory) is a serial printer, such as Radio Shack's DMP-100. Input from or output to any other peripheral device, such as the modem, must be program-

KEY PRESSED	FUNCTION	CHARACTER SENT
<BREAK>	BREAK	NONE
<CLEAR>	CLEAR SCREEN	NONE
Left ARROW	BACKSPACE	BACKSPACE
<SHIFT> L. ARROW	ERASE LINE	DELETE
<SHIFT>ZERO	UPPER/lower case	NONE
Down ARROW	<CNTRL>	CONTROL CHARACTER
		See Note Below
<CNTRL> + <SHIFT> UP ARROW	LONG BREAK	NULL
		NONE

NOTE: The DOWN ARROW <CNTRL> Key Causes Terminal to Pause and wait for next key pressed. The "control code" for that character is then sent to the host.
Most Host Computers support the use of special "control characters" such as "CNTRL-C." When the keyboard is in lower case mode, the proper control code can be sent by <CNTRL> then <SHIFT> character.

```

00010 *
00020 *          (C)1983
00030 *          FRANK GOSSETTE
00040 * DEPARTMENT OF GEDGRAPHY
00050 * UNIVERSITY DF DELAWARE
00060 *
00100          DRG          $7000
00110 *
00120 * CC-TALK TERMINAL
00130 *          1/D RDUTINES
00140 *
A1C1 00150 PDLKEY  EQU          $0A1C1
A30A 00160 SCNOUT  EQU          $0A30A
A920 00170 CLRSCH  EQU          $0A920
B3ED 00180 INTCNV  EQU          $B3ED
0000 00190 CURPDS  EQU          $00
3CFF 00200 MAXBUF  EQU          $3CFF
00210 *
00220 *
00230 * MAIN TERMINAL LDDP

```

7D00 06	00	00240 *		
7D02 A7	0D 001E	00250	START	LDA #000
7D06 0D	3C	00260		STA MDDE,PCR
7D08 26	04	00270	TERM	BSR INCHEK
7D0A 0D	1E	00280		BNE TMDDE
7D0C 20	F0	00290		BSR KEYCHK
7D0E 6D	0D 0012	00300		BRA TERM
7D12 26	0C	00310	TMDDE	TSI MDDE,PCR
7D14 0D	A30A	00320		BNE DOTHER
7D17 01	0D	00330		JSR SCNDUT
7D19 26	E0	00340		CMPA #00D
7D1B 17	00FC	00350		BNE TERM
7D1E 20	E4	00360		LBSR SCRDLL
7D20 0D	20	00370		BRA TERM
7D22 20	E2	00380	OTHER	BSR ALTMD0
		00390		BRA TERM
		00400 *		
7D24		00410	MDDE	RMB 1
7D25		00420	BUFPDS	RMB 2
7D27		00430	SCNPDS	RMB 2

7D29	2A	00440	LINCHR	FCB	\$2A	7D5F EF	0C C5	00720	STU	SCMPDS,PCR
		00450 *				7D62 A7	80	00730	SAVE	STA ,X+
7D2A BD	A1C1	00460	KEYCHK	JSR	PDLKEY	7D6A AF	0C BE	00740	STX	BUFPDS,PCR
7D2D 27	14	00470	BEQ	XKEY		7D67 BC	3CFF	00750	CMPL	#MAXBUF
7D2F 01	03	00480	CMPL	\$03		7D6A 1027	0113	00760	LBE0	NSG
7D31 26	0D	00490	BNE	DECDD		7D6E 35	D4	00770	KALT	PULS PC,U,X,B
7D33 A6	0D FFED	00500	LDA	MODE,PCR				00780 *		
7D37 B1	02	00510	CMPL	\$02				00790 *	RS232	OUTPUT
7D39 26	02	00520	BNE	RET1				00800 *		
7D3B 35	02	00530	PULS	A		7D70 BE	0160	00810	WTOUT	LDX \$00160
7D3D 35	10	00540	RET1	PULS	X	7D73 30	1F	00820	OUT1	LEAX -1,X
7D3F 39		00550	RTS			7D75 26	FC	00830	BNE	OUT1
7D40 17	0095	00560	DECDD	LBSR	KEYCDD	7D77 39		00840	RTS	
7D43 39		00570	XKEY	RTS		7D70 34	17	00850	DUTCHR	PSHS X,B,A,CC
		00580 *				7D7A 1A	50	00860	ORCC	\$050
7D44 17	0064	00590	INCHK	LBSR	INPUT	7D7C 7F	FF20	00870	CLR	\$0FF20
7D47 01	00	00600	CMPL	\$000		7D7F 8D	EF	00880	BSR	WTOUT
7D49 39		00610	RTS			7D81 34	02	00890	PSHS	A
		00620 *				7D83 C6	00	00900	LDB	\$000
7D4A 34	54	00630	ALTMDD	PSHS	U,X,B	7D85 64	E4	00910	DUT2	LSR ,S
7D4C E6	0C DA	00640	LDB	LINCHR,PCR		7D87 49		00920	ROLA	
7D4F EE	0C D5	00650	LDU	SCMPOS,PCR		7D88 49		00930	ROLA	
7D52 AE	BC D0	00660	LDX	BUFPDS,PCR		7D89 87	FF20	00940	STA	\$0FF20
7D55 81	20	00670	CMPL	\$020		7D8C 0D	E2	00950	BSR	WTOUT
7D57 24	09	00680	BHS	SAVE		7D8E 5A		00960	DECB	
7D59 01	0D	00690	CMPL	\$00D		7D8F 26	F4	00970	BNE	OUT2
7D5B 26	11	00700	BNE	XALT		7D91 86	02	00980	LDA	\$002
7D5D E7	C0	00710	ST0	,U+		7D93 B7	FF20	00990	STA	\$0FF20

It's time we put our chips on the table

... and showed you our best deals on computer hardware.

HARDWARE SPECIALS

Extended Basic w/bk	\$39.95
64k (DEI) Memory Upg	\$59.95
Amdisk Disk Drives	\$99.95
26-3029 CoCo Drive 0	\$309.95
26-3023 CoCo Drive 1	\$239.95
HUL Keyboard (D,E,F,2)	\$79.95
Super Pro Keyboard (D,E,F)	\$64.95
26-3127 64k Extended CoCo 2	\$209.95
26-3026 16K Standard CoCo2	\$119.95
26-3027 16K Extended CoCo2	\$159.95
26-3801 Model 100 8k	\$549.95
26-3816P 8K Upgrade Model 100	\$99.95
26-1192 CGP-115 Printer/Plotter	\$169.95
26-1271 DMP-110 Printer 50 cps	\$349.95
C. Itoh 8510 AP Printer 120 cps	\$399.95
Gorilla/NAP Video Monitor (Grn)	\$109.95
Video Monitor Adapters	\$89.95
26-3024 RS Multi-Pac Interface	\$99.95
Bolel Ser/Par Interface	\$69.95

ACCESSORIES

RS D.C. Modem IB	\$ 89.95
Novation J-Cal Modem	\$129.95
RS D.C. Modem II	\$179.95
Signalman MK X Modem	\$179.95
Hayes SM 300 Modem	\$239.95
USR Password 1200/300	\$429.00
CoCo Switcher	\$ 39.95
Elephant Disks ssdd	\$ 22.95
26-3030 OS-9 (64k)	\$ 64.95 (disk)
Basic-09 (req. OS-9)	\$ 87.95 (disk)
"C" Compiler (OS-9)	\$ 87.95 (disk)
FHL O-Pak (req. OS-9)	\$ 34.95 (disk)
Elite Word	\$ 59.95 (d&c)
Elite Calc	\$ 59.95 (d&c)
Color Term Plus	\$ 29.95 (cass)

NEW! Dual Double Sided Drives including case, power supply & cable \$475.00
NEW! 26-3128 64K Direct Video CoCo2 \$219.95

MSI SOFTWARE

MSI DISKUTIL	NEW	\$19.95
CDLDR FINANCE 1		\$49.95
COLOR FINANCE 11	NEW	\$69.95
MSI NAMEFILE		\$24.95
MSI CALENDAR	NEW	\$19.95

Call for prices and availability of your favorite software and hardware. All advertised items subject to availability. Prices do not include shipping and handling. All of the above units are covered by our 120 day carry-in warranty.

TRS-80 Trademark Tandy Corporation. Prices subject to change without notice. Write for our FREE newsletter.

TOLL FREE TENNESSEE 1-800-545-2502 | TOLL FREE 1-800-251-5008



DELKER ELECTRONICS, INC.
P.O. Box 897
Dept. R
408C Nissan Blvd.
Smyrna, TN 37167



800-251-5008
800-251-2502 (TENNESSEE)
615-459-2636 (TENNESSEE)
615-254-0088 (NASHVILLE)



triad pictures corp.

p o box 1299 sequim, wa 98382

INSTANT ANIMATION!

Create your own FULLY ANIMATED CARTOONS!

THE ANIMATOR puts YOU in command of a Hollywood style animation studio. Up to a minute-end-a-halt of animation (over 600 frames)! 12 HELP screens! Full "cel" animation (as used by Disney) for smooth results! Includes an extensive manual and 3 cassettes. NO PROGRAMMING NECESSARY!

32K/EXT. 3-CASS. PKG. \$35

ALPHABET STEW

Pre-schoolers command the computer!

Even kids as young as 18 months squeal with delight when the computer responds to THEIR touch! 70 different animated pictures & songs! Helps build KEYBOARD FAMILIARITY. Kids of all ages will use it for hours!

32K/EXT. CASS. \$18

TRI-GRAF

Hi-res graphics at your fingertips!

Create "SLIDE-SHOWS" of unlimited length! Great for charts, lessons . . . any presentation! COPY feature for multiple images! Mix TEXT & GRAPHICS on the same screen! Automatic CIRCLES! Compatible with THE ANIMATOR!

16K/EXT. CASS. \$16

SUPERFLASH & SPELLING LIST

Create YOUR OWN educational software!

SUPERFLASH lets you create up to 300 computerized super "flashcards". Use SPELLING LIST and your child's list from school to create personalized lessons. NO PROGRAMMING NECESSARY!

SUPERFLASH: 16 & 32K/EXT. CASS. \$14

SPELLING LIST: 16K. EXT. CASS. \$12

OR ORDER BOTH FOR ONLY \$22!

Please send me:

order form

_____\$
_____\$
_____\$
_____\$

Add \$2 SHIPPING AND HANDLING \$
(3 or more - we pay s/h) TOTAL \$

name _____
address _____
city _____ state _____ zip _____

send this to:
TRIAD PICTURES
P.O. Box 1299
Sequim, WA 98362
(206) 683-6459

7D96 0D	D0	01000	0SR	WTDUT
7D98 0D	D6	01010	0SR	WTDUT
7D9A 32	61	01020	LEAS	1,S
7D9C 35	97	01030 XOUT	PULS	PC,X,B,A,CC
		01040 *		
		01050 * RS232 INPUT		
		01060 *		
7D9E 0E	00C0	01070 HALF	LDX	000C0
7DA1 20	03	01080	0RA	INWAIT
7DA3 0E	0171	01090 FULL	LDX	00171
7DA6 30	1F	01100 INWAIT	LEAX	-1,X
7DA8 26	FC	01110	0NE	INWAIT
7DAA 39		01120	RTS	
		01130 *		
7DAB 34	15	01140 INPUT	PSHS	X,0,CC
7DAD 1A	50	01150	DRCC	0050
7DAF 06	FF22	01160 IN1	LDA	00FF22
7DB2 47		01170	ASRA	
7DB3 25	1F	01180	BLD	XINP
7DB5 0D	E7	01190	0SR	HALF
7DB7 06	FF22	01200	LDA	00FF22
7DBA 47		01210	ASRA	
7DBB 25	F2	01220	BLO	IN1
7DBD 4F		01230	CLRA	
7DBE 34	02	01240	PSHS	A
7DC0 C6	07	01250	LDB	0007
7DC2 0D	DF	01260 IN2	BSR	FULL
7DC4 B6	FF22	01270	LDA	00FF22
7DC7 47		01280	ASRA	
7DC8 66	E4	01290	ROR	,S
7DCA 5A		01300	DEC0	
7DCB 26	F5	01310	0NE	IN2
7DCD 0D	D4	01320	0SR	FULL
7DCF 35	02	01330	PULS	A
7DD1 44		01340	LSRA	
7DD2 20	01	01350	0RA	INEND
7DD4 4F		01360 XINP	CLRA	
7DD5 35	95	01370 INEND	PULS	PC,X,0,CC
		01380 *		
		01390 * KEYBOARD DECODER		
		01400 *		
7DD7 01		01410 ECHD	FCB	001
7DD8 34	02	01420 KEYCDD	PSHS	A
7DDA 01	20	01430	CNPA	0020
7DDC 24	2E	01440	0XS	TECHD
7DDE 01	08	01450	CNPA	0008
7DE0 27	2A	01460	0ED	TECHD
7DE2 01	0C	01470	CNPA	000C
7DE4 26	05	01480	0NE	DEL
7DE6 0D	A920	01490	JSR	>CLRSCN
7DE9 20	2C	01500	BRA	XKEYCD
7DEB 01	15	01510 DEL	CNPA	0015
7DED 26	04	01520	0NE	CNTRL
7DEF 06	7F	01530	LDA	007F
7DF1 20	21	01540	0RA	SNDKEY
7DF3 01	0A	01550 CNTRL	CNPA	000A

7DF5 26	0F	01560	BNE	ENTER	7E68 06	01	02140	LDA	##01
7DF7 8D	A1C1	01570 K2	JSR	POLKEY	7E6A A7	0D FE06	02150	STA	MODE,PCR
7DFA 27	F0	01580	BEQ	K2	7E6E 16	FE95	02160	LBRA	TERM
7DFC 80	40	01590	SUBA	##40			02170 *		
7DFE 01	1F	01600	CMPA	##1F			02180 *	BUFFER FULL	MSB
7E00 26	12	01610	BNE	SNDKEY			02190 *		
7E02 0D	3F	01620	BSR	NULL	7E71	2A	02200 MCHAR	FCC	/**BUFFER FULL
7E04 20	11	01630	BRA	XKEYCD	7E80	0D	02210 CR	FCB	##0D
7E06 01	0D	01640 ENTER	CMPA	##0D			02220 *		
7E08 26	0D	01650	BNE	XKEYCD	7E81 30	0C ED	02230 MSB	LEAX	MCHAR,PCR
7E0A 0D	0E	01660	BSR	SCROLL	7E84 A6	00	02240 SHOW	LOA	,X+
7E0C 6D	0C C0	01670 TECHD	TST	ECHO,PCR	7E86 8D	A30A	02250	JSR	SCNOUT
7E0F 27	03	01680	BEQ	SNDKEY	7E89 01	0D	02260	CMPA	##0D
7E11 0D	A30A	01690	JSR	SCNOUT	7E8B 26	F7	02270	BNE	SHOW
7E14 17	FF61	01700 SNDKEY	LBSR	OUTCHR	7E8D 35	74	02280 ABORT	PULS	U,Y,X,B
7E17 35	02	01710 XKEYCD	PULS	A	7EBF 39		02290	RTS	
7E19 39		01720	RTS				02300 *		
		01730 *					02310 *	UPLOAD ROUTINE	
		01740 *	SCREEN SCROLL				02320 *		
		01750 *			7E90 17	FF1B	02330 TSTIN	LBSR	INPUT
7E1A 34	16	01760 SCROLL	PSHS	X,B,A	7E93 01	00	02340	CMPA	##00
7E1C 9E	00	01770	LDX	<CURPOS	7E95 27	03	02350	BEQ	XTST1
7E1E 0C	05A0	01780	CMPX	##05A0	7E97 8D	A30A	02360	JSR	SCNOUT
7E21 23	1E	01790	BLS	XSCRL	7E9A 39		02370 XTST1	RTS	
7E23 30	0B C0	01800	LEAX	-#40,X			02380 *		
7E26 34	10	01810	PSHS	X	7E9B 8D	B3E0	02390 UPLOAD	JSR	INTCNV
7E28 0E	0400	01820	LDX	##0400	7E9E 1F	01	02400	TFR	D,X
7E28 EC	0B 40	01830 MOVE	LDD	#40,X	7EA0 A6	04	02410	LDA	,X
7E2E ED	01	01840	STD	,X++	7EA2 34	02	02420	PSHS	A
7E30 AC	E4	01850	CMPX	,S	7EA4 EE	02	02430	LOU	2,X
7E32 23	F7	01860	BLS	MOVE	7EA6 06	02	02440	LDA	##02
7E34 CC	6060	01870 BLANK	LDD	##6060	7EA8 A7	0D FE70	02450	STA	MODE,PCR
7E37 ED	01	01880	STD	,X++	7EAC 0D	E2	02460 CHEKIN	BSR	TSTIN
7E39 9C	00	01890	CMPX	<CURPOS	7EAE 26	FC	02470	BNE	CHEKIN
7E3B 23	F7	01900	BLS	BLANK	7EB0 17	FE77	02480	LBSR	KEYCHK
7E3D 35	10	01910	PULS	X	7EB3 8D	DB	02490	BSR	TSTIN
7E3F 9F	00	01920	STX	<CURPOS	7EB5 A6	C0	02500	LOA	,U+
7E41 35	96	01930 XSCRL	PULS	PC,X,B,A	7EB7 17	FEBE	02510	LBSR	OUTCHR
		01940 *			7EBA 8D	0E	02520	BSR	TS TECH
		01950 *	LONG NULL BREAK		7EBC 6A	E4	02530	DEC	,S
		01960 *			7EBE 26	EC	02540	BNE	CHEKIN
7E43 34	12	01970 NULL	PSHS	X,A	7EC0 06	0D	02550 UPDONE	LDA	##0D
7E45 0E	3F00	01980	LDX	##3F00	7EC2 17	FE03	02560	LBSR	OUTCHR
7E48 06	00	01990	LDA	##00	7EC5 0D	C9	02570	BSR	TSTIN
7E4A 07	FF20	02000	STA	##FF20	7EC7 35	02	02580	PULS	A
7E4D 30	1F	02010 NWAIT	LEAX	-1,X	7EC9 39		02590	RTS	
7E4F 26	FC	02020	BNE	NWAIT			02600 *		
7E51 06	02	02030	LOA	##02			02610 *	TEST FOR FULL DUPLEX	
7E53 07	FF20	02040	STA	##FF20	7ECA 6D	0D FF09	02620 TS TECH	TST	ECHO,PCR
7E56 35	92	02050 XNULL	PULS	PC,X,A	7ECE 26	04	02630	BNE	XTEC
		02060 *			7ED0 8D	0E	02640 WECHO	BSR	TSTIN
		02070 *	INIT DOWNLOAD		7ED2 27	FC	02650	BEQ	WECHO
		02080 *			7ED4 39		02660 XTEC	RTS	
7E58 0D	B3E0	02090 DINIT	JSR	INTCNV			02670 *		
7E50 1F	01	02100	TFR	D,X			02680 *		
7E5D AF	0D FEC4	02110	STX	BUFFPOS,PCR			02690 *		
7E61 0E	0420	02120	LOX	##0420			02700	END	
7E64 AF	0D FEBF	02130	STX	SCNPOS,PCR			0000		
							00000 TOTAL ERRORS		

med by the user. Listing 3 provides the assembly language source code for the input/output interfaces and other high-speed terminal functions needed for telecommunications operations. (These operations can only be done in machine language, as BASIC is much too slow.)

The machine code is quite compact, occupying only 468 bytes of memory, and is completely relocatable (meaning it can be placed anywhere in Random Access Memory and it will function properly). The I/O routines employ some of the built-in functions from Color BASIC's Read Only Memory for polling the keyboard, clearing the screen, and displaying a character on the screen — thereby reducing the memory requirements of the routines. The assembly language program in Listing 3 was produced on Radio Shack's *EDTASM+* editor/assembler.

The assembly language routines which perform the actual serial input and output functions are subroutines *OUTCHR* (Listing 3, Lines 810 through 1030) and *INPUT* (Lines 1070 through 1370). *OUTCHR* sends the character in the 6809 CPU accumulator "A" to the serial output port (bit one of address \$FF20) as an eight-bit word with one start bit, seven data bits, space parity, and two stop bits. Subroutine *INPUT* checks the RS-232 input line (bit zero of \$FF22) for a start bit and, if found, returns a seven-bit ASCII character in accumulator "A" without checking parity.

While in one of the terminal modes, the I/O interface re-configures the functions of several of the keys, as described above, in subroutine *KEYCOD* (Lines 1420 through 1720). Whenever the down arrow key is pressed (redefined as the *CNTRL* key), the terminal waits on the next key pressed as the control charac-

ter to be sent. The routine also checks the contents of *ECHO* (Line 1410) to determine if you are operating in full or half-duplex mode — set by the variable *TFLAG* in the BASIC program. If you are operating in half duplex mode, input from the keyboard will be displayed on the screen before transmission.

"The major advantage of writing the main terminal program in BASIC is to provide the user with a telecommunications environment that can be modified to suit his or her particular needs."

Since the Color Computer's screen displays only 16 lines of 32 characters each, lines to text sent by the host computer (typically 80 columns in length) can quickly fill the screen. Most main-frame computers provide a "line-turn-around" delay at the end of each line to allow a hard-copy terminal time to reposition the print head back at the left of the page. The I/O interface takes advantage of this delay by scrolling the screen during this pause, if the screen is nearly full. This procedure (Lines 1760-1950 of Listing 3) opens at least two lines (64 characters) at the bottom of the screen for the next incoming line, and eliminates most instances of data loss due to having the screen scroll in the middle of a line being received.

The main terminal loop (Lines 270-390) controls the operations of talk mode and downloading. The routine continuously scans the input port for a character received, and either displays

the text on the screen or stores the incoming text in the memory buffer depending on the value of *MODE* (Line 410). When in download mode, subroutine *ALTMOD* does the input buffering and displays the line-received character (asterisk) for each line stored. When the buffer is full, a message is displayed and program control is returned to the BASIC menu.

Downloading is initialized in the routine *DINIT* (Lines 2090 to 1120). This procedure takes the argument *TBUFF* (line 60 in Listing 1) from the *USR2* call in the BASIC program as the starting point in memory for the downloaded text. Incoming data will be stored sequentially from this address up to *MAXBUF* (Listing 3, Line 200) — \$7CFF for a 32K system.

The uploading routine, Lines 2390 through 2590 of Listing 3, begins by retrieving the *VARPTR* argument of the string variable to be sent which was passed by the BASIC program. Extended Color BASIC's variable pointer for string variables defines a memory address which contains the length of the string, and the 16-bit address of the starting character of the string. These values are used by the routine to determine how many characters are to be sent and where to find them in memory. After sending the string, one character at a time, the routine appends a CR (Carriage Return) to the output stream and returns to the BASIC calling program. If you are operating in full duplex, the routine waits for the host's echo before sending the next character.

Enhancements And Other Features

Whether you are a beginning BASIC programmer or an accomplished hacker, there are numerous modifications and enhancements that can be made to the

Listing 4:

```
140 CLS:PRINTTAB(B)"BUFFER CONTE
NTS":PRINTTAB(6)"spaceMORE/enter
EXIT"
150 INPUT "SAVE FILE NAME":TF$:I
F TF$<>" " THEN TSAVE=1:OPEN "0",
#-1,TF$
160 ' <enter> ( null filename) t
o preview buffer contents only
170 BB=TB:BE=&H7CFF' buffer star
t and end addresses
180 J=0:SV$="":FOR I=BB TO BB+25
0
190 TC=PEEK(I):J=J+1:IF TC=13 TH
```

```
EN 195 ELSE SV$=SV$+CHR$(TC):NEX
T I
195 PRINT "no <cr> found" '250 c
haracters without end-of-line
200 PRINT SV$ 'display line on s
creen
210 GOSUB 260:IF TK$<>CHR$(32) T
HEN 230
215 IF TSAVE THN PRINT #-1,SV$ '
PRINT TO TAPE
220 BB=BB+J:IF BB<BE THEN 180
230 CLOSE #-1
240 RETURN 'end of save routine
```


package. One of the simplest, and most useful, would be to add the capability of actually saving downloaded text to tape or disk on your own system. Program Listing 4 provides an example of how this might be accomplished for those of you with tape systems. Lines 150 through 240 of the BASIC terminal driver program in Listing 1 are replaced with a new subroutine. First, you are prompted for the name of the new file. If you respond with a valid character string, a new file is opened to receive the text (an ENTER allows you to look, but not save). The program then PEEKs into the memory buffer and creates a string variable until the end-of-line carriage return character is encountered. Then, the line of text is written to the tape. This process continues for each line of text displayed on the screen as you press the space bar. Pressing the ENTER key will terminate saving, close the tape file, and return you to the main menu.

Any type of text, including a BASIC program listing, can be saved in this fashion. Since the file is an ASCII character file, a program can be loaded just as if it had been saved using Color BASIC's (CSAVE"filename",A) option. A useful further enhancement of this routine would be the option of choosing to

save, delete, or edit a downloaded line as it is displayed. I'll leave that idea for you to experiment with on your own.

Whenever you are connected to a mainframe computer — whether it is the computer at work, school, or one of the subscription services catering to microcomputer users — you need to spend some time to familiarize yourself with the peculiarities and functions of the operating system. In some cases, you can take advantage of the more powerful system software on the host to make your terminal session more enjoyable. For example, many operating systems allow you to specify certain attributes of your terminal — screen size, line width, end-of-line character (Carriage Return or Line Feed + Carriage Return) etc. If you can specify line width, set the host to send 32-character lines. This will eliminate the "word-wrap" of the Color Computer's screen which some people find annoying.

CC-Talk uses only the carriage return to terminate a line, and ignores a line feed if sent by the host. If the other computer requires a linefeed as part of the end-of-line signal, see if you can change the "terminal environment" settings on the host, or type CNTRL J

from the keyboard. When uploading a file to a system that requires a linefeed, you can add a line to the CCT.BAS program:

```
255 UP$=UP$ + CHR$(10)
```

This should cure any problems associated with that feature of the program.

When operating in full duplex mode, on some systems, it may be necessary to clear the screen prior to uploading a text string. If you encounter problems, simply modify Line 350 in the BASIC program to read:

```
350 IF TFLG=1 THEN PRINT UP$
ELSE CLS 'print or clear
```

The possibilities for further enhancements to the package are endless — put your ingenuity to good use. I use a highly modified version for turning the Color Computer into a color graphics terminal running mapping and graphics software on the university's mainframes. Perhaps, in a future article, I'll show you how much fun that can be. In the meantime, enjoy this no-cost introduction to telecommunications and share your discoveries and enhancements with others!



TRS-80 COMPUTER DISCOUNTS

COLOR COMPUTERS



*26-3134 16k color II	89.95
*26-3136 16k ext color II	125.00
*26-3127 64k color comp	175.00
26-3029 1st disk drive	289.95
26-1161 2nd disk drive	229.95

PRINTERS

26-1271 DMP-110	299.95
26-1254 DMP-200	510.00
26-1255 DMP-120	395.00
26-1257 DWP-210	500.00

MODEL 4 and 100's

26-1067 mod 4 16k	699.95
26-1068 mod 4 64k 1 dr.	900.00
26-1069 mod 4 64k 2dr.	1020.00
26-1080 mod 4 p	1020.00
26-3801 mod 100 8k	499.95
26-3802 mod 100 24k	619.95

*Prices good through 11-25-84

**We Carry the Complete Line of TRS-80
Computer Products at Discount Prices
CALL FOR A FREE PRICE LIST 800-257-5556
IN N.J. CALL 609-769-0551**

WOODSTOWN ELECTRONICS

Rt. 40 E. WOODSTOWN, N.J. 08098

*A comprehensive listing
of bulletin board systems*

BBS Wrap-Up



By R. Wayne Day

Here is a verified list of 92 bulletin boards which are of interest to CoCo users. The list contains BBS systems that are dedicated to the CoCo, as well as BBS systems which are covering more specialized interests, such as OS-9 and FLEX.

Each of these listings have been verified during

(Wayne Day, a traffic engineering signal technician, is the SYSOP of The Color SIG of CompuServe, the world's largest consumer information service. He is also a certified paramedic and works part-time for an Emergency Medical Service provider. His amateur radio operator call sign is WA5WDB.)

the months of July, August and September of this year. To the best of my knowledge, the information contained in the list is accurate and up to date.

The times given in the notes are the local times of the BBS in 24 hour military time (1700 = 5 p.m.).

If you call a particular number, and the phone is not answered by the BBS, it may mean that the board is "down" for maintenance, there is a power failure in the BBS's area, or the system operator may be on vacation.

If, though, over a period of a couple of weeks,



the board still fails to answer, you can assume that it is no longer available for use.

Notoriously, bulletin boards come and go, almost as often as BBS lists do. In fact, more than one person has been known to quip that some BBS systems just wait until their number is published, then pull the plug.

To that end, we at THE RAINBOW would like you to help us keep this BBS list accurate. Please advise us of any changes, corrections, additions or deletions you may find.

Please address your BBS information to:

Wayne Day, Contributing Editor
The Rainbow
9529 U.S. Highway 42
Box 385
Prospect, KY 40059

Or you may electronically notify us of changes by using:

CompuServe EMAIL to 76703,376
or
MCI Mail to Wayne Day (201-7723)

A/C	Number	City	BBS Name	Remarks
(201)	572-0617	New Brunswick, NJ	CoCo Board	
(201)	637-6286	Vienna, NJ	Colorama of NJ	
(201)	725-5028	Manville, NJ	C.C.I.E.	
(201)	827-7815	Ogdenburg, NJ	PeopleLinks	
(206)	255-5150	Renton, WA	The Light House	
(206)	256-2321	Vancouver, WA	Northwest Color Conn	
(209)	223-3800	Jackson, CA	Gold Country	
(212)	441-3755	Woodhaven, NY	Rainbow #1	
(212)	441-3766	Woodhaven, NY	Rainbow #2	
(212)	441-5719	Woodhaven, NY	Rainbow #3	
(212)	441-5907	Woodhaven, NY	Rainbow #4	
(212)	825-0780	Governors Isl., NY	Colorama	Note 2
(213)	244-1100	Burbank, CA	Fantasy Plaza	
(213)	258-0640	Los Angeles, CA	Musashi-Color 80	
(213)	388-5198	Los Angeles, CA	Magnetic Fantasies	
(213)	690-4589	Los Angeles, CA	The Next Step	Note 3
(215)	277-6951	<unknown>	MY BBS (OS9)	Note 4
(216)	788-7910	Youngstown, OH	CoCo Nut Tree	
(217)	753-3167	Springfield, IL	Link up	
(219)	256-5782	Mishawaka, IN	SAGCOM CoCo Line	
(303)	690-9423	Aurora, CO	Controller Board	
(304)	599-0760	Morgantown, WV	Mountaineer	
(305)	274-3394	Miami, FL	RemoteOS9	
(305)	681-6809	Hialeah, FL	CoCo Corner	
(305)	681-8490	Hialeah, FL	CoCo Corner #2	
(305)	751-6809	Miami, FL	Color Info Center	
(308)	665-1526	Crawford, NE	Colorama	Note 9
(312)	286-9015	Chicago, IL	Skylink	
(312)	397-8308	Chicago, IL	OS-9 Users Gp.	Note 1
(312)	597-8485	Chicago, IL	Creme de CoCo	
(312)	720-0796	Chicago, IL	CoCo Extraordinaire	
(312)	879-6811	Batavia, IL	Speech Systems	
(313)	981-5061	Canton, MI	CoCo Club	
(315)	487-0503	Syracuse, NY	Color-80	
(316)	686-3813	Wichita, KS	Color-80	
(401)	272-1138	Providence, RI	Syslink-80	
(403)	474-0147	Edmonton, Alberta	Northern Alberta CoCo	
(404)	378-4410	Atlanta, GA	CoCo Board HQ	HQTRS SYS
(405)	728-7654	Oklahoma City, OK	FLEXNET	
(405)	248-8433	Lawton, OK	Shambala	
(408)	984-7937	San Jose, CA	Rainbow #5	
(409)	983-2383	Port Arthur, TX	CoCo Club BBS	
(412)	744-2335	Pittsburgh, PA	CoConet	
(415)	782-4402	Berkley, CA	East Bay BBS	
(416)	494-7001	Toronto, Ontario	Colour BBS	
(416)	653-2248	Toronto, Ontario	Colour Dragon #1	
(416)	689-7950	Toronto, Ontario	Dave's Datacom	
(501)	735-5614	West Memphis, AR	CoBBS #1	
(503)	649-4497	Aloha, OR	Bee Color BBS	
(503)	761-6345	Portland, OR	Bit Bucket Sys	
(504)	277-9450	New Orleans, LA	N.O. CoCo BBS	
(512)	285-5028	Elgin, TX	Colorama	HQTRS SYS
(513)	474-2985	Cincinnati, OH	CINTUG	
(515)	277-6510	Des Moines, IA	CoCo Club	
(516)	277-1285	Islip, NY	Colorama	
(516)	331-3718	Port Jefferson Sta., NY	Colorama	Note 9
(516)	673-9452	Long Island, NY	<unknown>	
(517)	339-3367	Lansing, MI	CompuNet TBBS # 1	
(517)	793-1579	Saginaw, MI	C/Net	

(604) 585-0680	Delta, British Columbia	Color-80	
(604) 738-2773	Vancouver, British Columbia	Color Pacific	
(615) 842-6809	Hixson, TN	68 Micro Journ.	FLEX
(617) 646-6809	Arlington, MA	Logical Products	
(619) 474-8981	San Diego, CA	JARB / CoCo SIG	Note 9
(701) 281-0233	Riverside, ND	Dakota Database	
(701) 839-0390	Fargo, ND	Country Micro BBS	Note 6
(703) 476-1147	Reston, VA	Samohr BBS	Note 5
(707) 437-6336	Travis AFB, CA	Falcon Color 80	
(713) 331-2599	Houston, TX	Freelancein'	
(713) 488-2003	Houston, TX	Freelancein' #2	
(717) 652-8659	Harrisburg, PA	Colorama	
(801) 544-3423	Clearfield, UT	Time Link	Note 9
(803) 279-5392	Augusta, SC	Augusta Forum TBBS	
(803) 288-0613	Greenville, SC	DLOAD OS-9 BBS	Note 7
(804) 887-5302	Williamsburg, VA	Gamma Color 80	
(805) 484-5491	Camarillo, CA	Colorama	
(805) 687-9400	Santa Barbara, CA	CoCo Corner	HQ SYS
(812) 476-9453	Evansville, IN	Evansville Connection	Note 8
(813) 879-1105	Tampa, FL	The CoCo BBS	
(813) 924-2626	Sarasota, FL	Color-80 #41	
(815) 458-6628	Will County, IL	Colorama	
(816) 232-4932	St. Joseph, MO	The Pony Express	
(817) 641-0133	Cleburne, TX	Dragonfire BBS	Note 9
(902) 683-2086	Port Mouton, Nova Scotia	Colorama	
(902) 857-9843	Hubbards, Nova Scotia	Colorama	
(904) 378-9222	Gainesville, FL	CoCoOS9 BBS	
(913) 384-2196	Kansas City, KS	Online Beta Sigma Pi	
(914) 362-1422	Pomona, NY	Telemation OS9	
(914) 965-2355	Westchester, NY	Westchester BBS	
(914) 965-7600	Yonkers, NY	Colorama	
(916) 381-8788	Sacramento, CA	Sacramento CCC	
(919) 758-5261	Greenville, NC	SangarNet	

NOTES: 1 OS9 Users Group. Type CR LF until it responds: "Please Log In". Then type HELLO-G500 ..3ENTER
2 Hours: 2000-1630 Mon.-Fri. 2000-1000 Week-end/Holidays

3 Pro Color File Users Group
4 2200-0800
5 Sat.-Sun. 0600-1000 Mon.-Fri. 1800-1900
6 Mon.-Fri. 2000-0800 Sun. 1800-Mon. 0800

7 Mon.-Sun. 2200-0700
8 Weekends ONLY
9 Evenings and Weekends (Generally after 1700 on weekdays)

Some Other BBSs That May Be Of Interest

Besides bulletin board systems devoted to the Color Computer, an active modem user can find quite a few other BBSs which might be of interest to him.

Here is a look at just a few, one of which is devoted to almost nothing but listings of other BBSs around the world!

(312) 545-8086 WARD AND RANDY'S CBBS

Chicago, IL - This is the original bulletin board system, first put together by Ward Christiansen in 1977. Far from resting on its laurels as the first micro-computer BBS, these folks continue to serve the Chicago area as a general interest board.

(202) 653-1079 U.S. NAVAL OBSERVATORY

Washington, D.C. - Run by the U.S. Government for the benefit of computer users, including various academic and scientific organizations, the Naval Observatory provides such information as the exact time of day (plus or minus 50ms), sidereal time (astrological time) as well as a program that will give you the sunrise or sunset times for any point on the earth.

This service supports 300 or 1200 Baud operation, 8 bits and even parity must be used.

(303) 632-3391 OLD COLORADO CITY ELECTRONIC COTTAGE

Colorado Springs, CO - Featuring a wide diversity of subjects ranging from

the current political campaigns to education, this T.B.B.S. gets a wide variety of viewpoints from across the country. An interesting aspect of this BBS is that, unlike many BBSs where the users are mainly interested in computers, the "citizens" of Old Colorado City almost seem to forget they are using computers, preferring to communicate about other subjects of a "grandeur" scale.

(213) 541-2503 R/CPM PALOS VERDES

Palos Verdes, CA - This Remote/CPM BBS is a favorite hang-out for hi-techies, with a healthy dose of amateur radio, to boot. If you're comfortable with hi-tech topics, this BBS will seem like home to you.

(817) 246-2532 CAMELOT

White Settlement, TX - On the west side of the Fort Worth-Dallas Metroplex, Camelot is a good example of a BBS that strives to serve the whole computer-user community in a metropolitan area. Local news and information are featured, with a healthy dose of humor thrown in.

(213) 842-3322 DIAL YOUR MATCH #1

Los Angeles, CA - Computerized dating services abound across the country with the Dial-Your-Match BBSs. This is the headquarters board, and has the listings of all the other Dial-Your-Match BBSs across the country. Keep trying to get in . . . it's a very popular BBS!

(303) 340-2473 THE ELECTRIC MAGAZINE

Denver, CO - An "online" magazine, with features ranging from computers to the newest in life styles. Easy reading, and fun!

(301) 460-0538 RBBS-PC BETHESDA

Bethesda, MD - This BBS, operated on an IBM PC, features the latest in

happenings in the Federal government, as well as medical special interests.

(415) 861-6489 CONFERENCE TREE

San Francisco, CA - Originally, this BBS started out looking for a new way to let folks communicate. Instead of the more commonly used "message numbers" that are assigned in numerical order, this BBS uses a "tree," where the original message on a particular subject is followed by replies and other messages about the same topic. To check which conferences are currently active, enter "READ CONFERENCES."

(301) 344-9156 NASA G.A.S. NET

Greenbelt, MD - No, it's not hot air from NASA, but rather a BBS devoted to the "Get Away Specials," the experiments carried aboard the Space Shuttle. This BBS always has interesting news about the current space projects, as well as some recognizable names, if you're into space and aeronautics.

(713) 483-4115 NASA ACTIVITIES TTY

Johnson Space Center, TX - This BBS details the current projects that

NASA's working on, as well as information about the NASA Manned Spaceflight Center in Houston. For an interesting time, see if you can get online with the system during one of the Shuttle flights!

(619) 578-2646 KID'S MESSAGE SYSTEM

San Diego, CA - If you're a kid, or interested in helping kids learn more about computers, this might be one of your favorite BBSs. Topics of discussion include educational and practical topics, as well as poetry, short stories and computer art, by kids. Even adults will have fun with this one!

(619) 561-7277 P.A.M.S.

Santee, CA - PAMS, the Public Access Message System, features one of the most comprehensive lists of BBSs worldwide, currently over 46,000 bytes long. At last count, there were even 20 BBSs listed outside of the United States and Canada. This is the one to check if you are looking for a BBS in a particular location, or just browsing to see what's available across the country.

**FLY
THE COCO-150**



\$49.95

WHEEL AND THROTTLE FUNCTION LIKE A 'REAL' AIRPLANE - ADD REALISM TO YOUR FLIGHT SIMULATOR PROGRAMS !!!

SPECIAL COMBO OFFER
FOR MIX 'WORLDS OF FLIGHT' (WOF) + COCO-150
\$72.95 (\$149.95 CD)

OR

ASI-IFR FLIGHT SIMULATOR - THE MOST VALID HOME COMPUTER INSTRUMENT FLIGHT SIMULATOR PROGRAM WE KNOW OF FOR PRACTICING IFR NAVIGATION AND APPROACHES USING CURRENT ACTUAL FAA MAPS AND APPROACH PLATES. PROGRAM ALLOWS QUICK AND EASY CUSTOMIZING TO YOUR LOCAL AREA AND UPDATES AS YOUR LOCAL FAA CHARTS CHANGE. PRICE INCLUDES COPIES OF OFFICIAL FAA FLORIDA SECTIONAL AND 5 ILS APPROACH PLATES. COCO-150 OR JOYSTICKS REQUIRED + 16K OR 32/64K (SPECIFY)

ASI-IFR \$15.95 (TAPE ONLY)

ASI-IFR + COCO-150 \$59.95

EVERYTHING PACKAGE - COCO-150 + WOF + ASI-IFR \$82.95
ADD \$3.50 POSTAGE AND HANDLING - FLA. RESIDENTS ADD 5% SALES TAX
SEND CHECK OR MONEY ORDER TO:

ALBAN SCIENTIFIC, INC.
P.O. BOX 13226
DAYTONA BEACH, FLORIDA 32114

VISA/MASTERCARD CALL 804-252-5102

INCREDIBLE!!

Turn your CoCo into
a powerful processor
with CCSM*

the most productive operating system
and programming language available for
any micro -- regardless of price!!

- Write professional software
- Virtual Memory, a la Mainframe
- Your programs can be as large as your disk

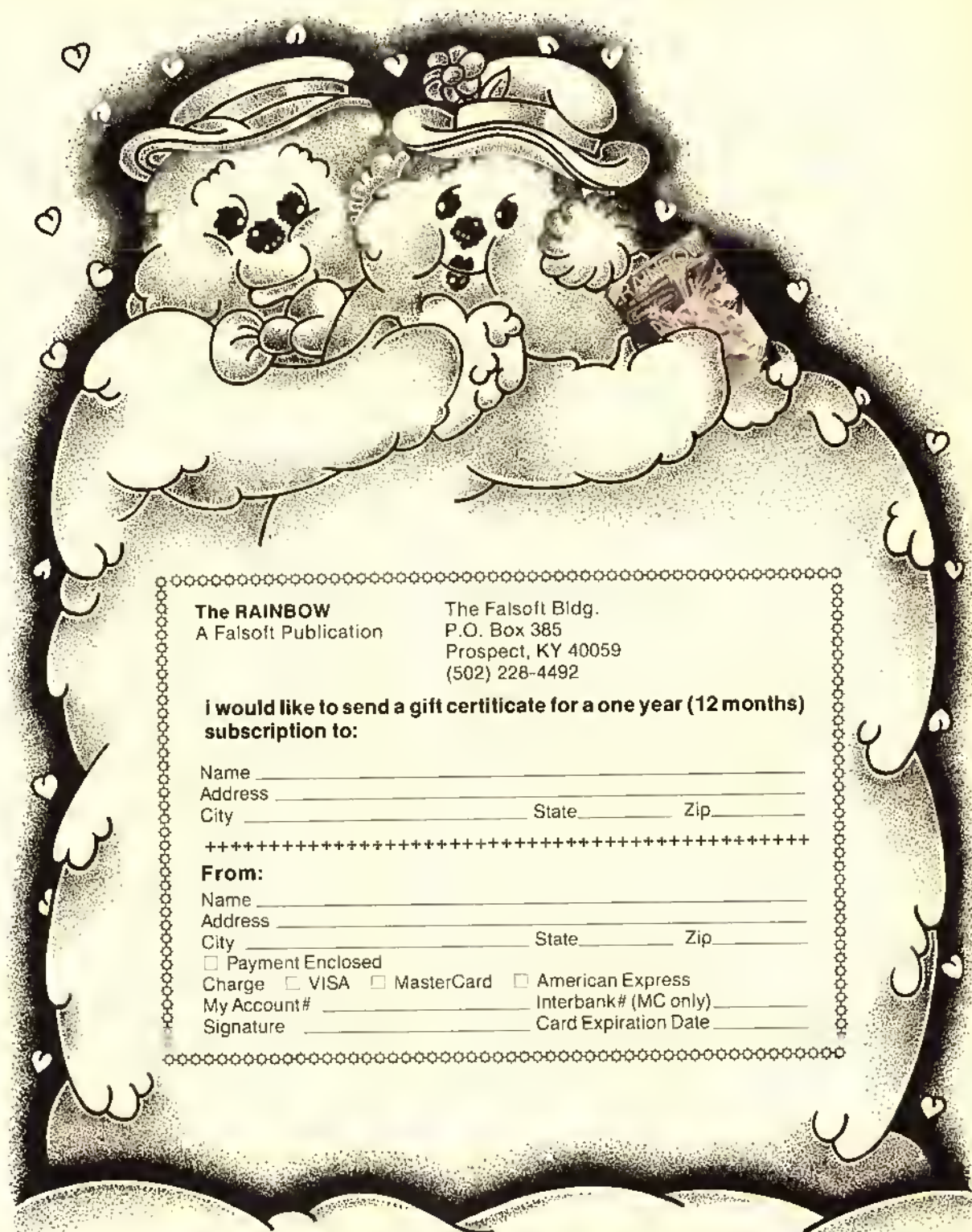
* CCSM - Comp Consultants Standard Mumps

Call or Write:



16260 Midway Road • Dallas, Texas 75234 • (214) 733-4100

It's no job to give the perfect gift for this Christmas.



The RAINBOW
A Falsoft Publication

The Falsoft Bldg.
P.O. Box 385
Prospect, KY 40059
(502) 228-4492

I would like to send a gift certificate for a one year (12 months) subscription to:

Name _____
Address _____
City _____ State _____ Zip _____

From:

Name _____
Address _____
City _____ State _____ Zip _____

☐ Payment Enclosed

Charge ☐ VISA ☐ MasterCard ☐ American Express

My Account# _____ Interbank# (MC only) _____

Signature _____ Card Expiration Date _____

Get the ball rolling and fill out the form above to give someone a **RAINBOW certificate in time for the holidays.**

Prices subject to change.

Subscriptions to the **RAINBOW** are \$28 a year in the United States. Canadian and Mexican rate \$35 U.S. Surface rate to other countries \$65 U.S.; air rate \$100 U.S. All subscriptions begin with the current issue. Please allow up to 5-6 weeks for first copy. U.S. FUNDS only.

Just for your
TRS-80® COLOR
TDP System 100
Dragon-32
MC-10

*An in-depth lesson on terminal programs and
hints and tips on . . .*

Modeming Across America

By Wayne Day
Rainbow Contributing Editor

Last month, we began our journey through the world of telecommunications with a quick look at the basics of what you'll need to get started: your CoCo, a modem, phone line and, of course, a terminal program. This month, we'll expand our look at the terminal program, as well as offer a few hints and tips on successfully "Modeming Across America."

No matter how much RAM you have in your computer, or how much you spend on the latest in "super-techno" autodialing, coffee-making modems, you can't do a thing with them without some sort of terminal program which lets you communicate with the remote information system you're "talking" to, be it CompuServe, a bulletin board system (BBS) or another CoCo.

Two functions *must* be accomplished by the terminal program:

- 1) Each time you press a key on your computer, the terminal program must convert the data generated into ASCII data and send that information out the serial RS-232 port to the modem; and
- 2) It must convert the data received from the modem (ASCII) into the appropriate signal that's used to generate a character on your screen.

Those are the absolutes — what we might call a "dumb" terminal because it can only do the very simple things.

A good example of a dumb terminal program is the Radio Shack *Videotex* program, which has been available in both tape and ROM cartridge versions. *Videotex* is usually the first communications program to be acquired by most CoCo users, since it is available in every Radio Shack store in the country.

Operation of *Videotex* is simple, merely a matter of plugging the cartridge in, turning the computer on, dialing up the BBS, and away you go. After your online session is over, though, and you've hung up the phone, about the only thing you can do with *Videotex* is review the last few pages of information that *Videotex* has received.

As a dumb terminal, *Videotex* doesn't have any built-in way to send any of the data you received to a printer and you can't store any of the information on disk or tape.

So what can a "smart" terminal program do for you? Let's go back to the very beginning of our telecommunications session, and see how a terminal program with "smarts" could help us out.

Since many of the modems being sold today have the capability of "picking up" the phone and dialing a telephone number, we could ask the terminal to remember our most frequently called numbers for us. Additionally, why would you want to type in the correct login sequence every time you call your favorite BBS or CompuServe? The sequence rarely changes, and it's a time waster for you, right? Let's combine those two features and call them "AUTODIAL and AUTOLOGON."

How does the terminal program remember the numbers and your logon sequence? Our "smart" terminal program lets you build a text file that contains all the information needed, and then recalls that information when you tell it to.

(Wayne Day, a traffic engineering signal technician, is the SYSOP of The Color SIG of CompuServe, the world's largest consumer information service. He is also a certified paramedic and works part-time for an Emergency Medical Service provider. His amateur radio operator call sign is WA5WDB.)



SR-71

SR-71 is a fast action game in which you are the pilot on a mission to take photographs of missile sites in Russia and deliver them to our processing laboratory in Japan. So real you will feel as if you are in the cockpit on a real spy mission. Eude Russian missiles as well as their detection devices. Another Tom Mix exclusive. A must for the adventurous. Fantastic graphics, color and sound. 32K Ext. Basic

TAPE \$28.95 DISK \$31.95



KING TUT

Journey through the caverns of King Tut's tomb. You are on a quest to find treasures hidden in the caverns below. You light your way with only a small candle that grows dimmer as time passes. Watch out for the snakes and the ghost of King Tut himself. Five screens challenge your abilities every step of the way. Joysticks required.

16K MACHINE LANGUAGE
TAPE \$27.95 DISK \$30.95



THE KING

This game contains all 4 full graphic screens like the popular arcade game. Exciting sound and realistic graphics. Never before has the color computer seen a game like this. Early to mid 1980's. Only computer graphics. On screen. No sound.

32K MACHINE LANGUAGE

TAPE \$26.95

DISK \$29.95



CU*BER

Approaches the excitement and challenges of any Video Arcade. The hazards of CU*BER are many. Help CU*BER change the colors on the pyramid while avoiding many of the dangers.

the Dork, bonus points all add up to another exciting release from Tom Mix Software.

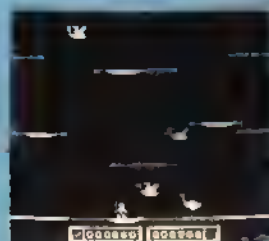
32K MACHINE LANGUAGE TAPE
\$27.95 DISK \$30.95

BUZZARD BAIT

We've done it again. You thought The King was great? Wait till you see this! Outstanding high resolution graphics, tremendous sound make this "joust" type game a must for your software collection. As you fly from cloud to cloud you will

the challenges presented to you by this newest release by Tom Mix Software.

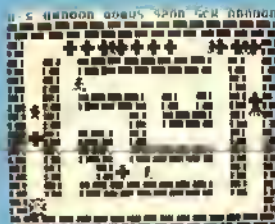
Joysticks required.
32K MACHINE LANGUAGE
TAPE \$27.95 DISK \$30.95



FANGMAN

Fangman is a high-resolution graphics arcade-type game based on the Dracula legend. Plot of Game: You're Dracula in your castle, stalking through a labyrinth of passages in search of invading villagers seeking to destroy you by blocking your every path with deadly crosses. Then all the Sun also wanders your halls, trying to touch you and turn you to bones and dust. Fortunately, you have allies of your own, your vampire bats who chase down the villagers, holding them till you arrive. Joysticks required.

16K MACHINE LANGUAGE
TAPE \$24.95 DISK \$27.95



HERE IS A GREAT UTILITY PROGRAM

SCREEN PRINT ROUTINE Prints contents of your graphic screen to an Epson, Microline or Radio Shack DMP Printers. Prints positive or reverse format. Horizontal or vertical, small and large printout. Print left, right, or center of page. Specify printer when ordering.

TAPE \$15.95 DISK \$21.95

TAPE TO DISK New version works both 1.0 and 1.1 DOS. Load the contents of most tapes to disk automatically.

16K MACHINE LANGUAGE TAPE \$17.95 DISK \$21.95

Tom Mix Software Now Offers The Complete VIP Library System

VIP Writer™

RATED TOPS IN RAINBOW, HOT COCO, COLOR COMPUTER MAGAZINE & COLOR COMPUTER WEEKLY.

32K (Comes with tape & disk) \$69.95
(Includes VIP Speller)

VIP Speller™

WITH A 60,000 WORD INDEXED DICTIONARY It can be used to correct any ASCII file — including VIP Library™ files and files from Scripts™ and Teletwiter™.

32K DISK ONLY \$49.95

VIP Calc™

You can forget the other toy calcs — The real thing is here! No other spreadsheet for the Color Computer gives you so many features.

32K (Comes with tape & disk) \$69.95
32K does have hi-res displays, sort or edit.

VIP Terminal™

RATED BEST IN JANUARY 1984

"RAINBOW" Choice of 8 hi-res lowercase displays Memory-Sense with BANK SWITCHING for full use of workspace.

32 K (Comes with tape & disk) \$49.95

(Tape comes in 16K but without hi-res displays)

VIP Database™

INCLUDES MAIL MERGE CAPABILITIES TOO! 32K DISK \$59.95 64K Required for math package & mail merge.

VIP Disk-Zep™

Repairs crashed disks.
16K DISK \$49.95 Lowercase displays not available with this program.



TOM MIX SOFTWARE

4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

• ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) •
• MICHIGAN RESIDENTS ADD 4% SALES TAX •

LOOKING FOR NEW SOFTWARE

TOP ROYALTIES PAID

(616) 957-0444



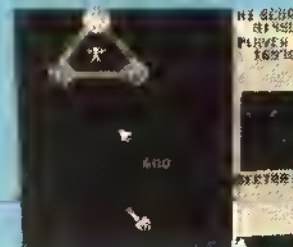
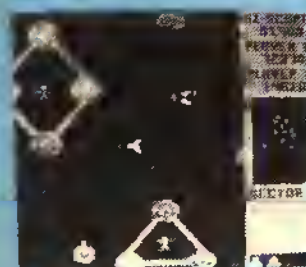


DRACONIAN

You brace yourself as your ship materializes in the enemy sector. Your engine roars to life, and you consult the long-range scanner for the position of the nearest enemy base. As you head for the base, blasting asteroids and space mines in your path, you suddenly notice a monstrous space-dragon looming before you. Reacting quickly, you dodge his deadly fire-breath and blast him out of existence.

Finally, the enemy base comes into view. Avoiding the enemy fire, you destroy the gun turrets one by one with your rapid-fire torpedoes. Then, with the explosions still echoing around you, you rescue the astronaut who was being held prisoner by the enemy. Your mission is far from over, however, as there are more bases to destroy and more astronauts to rescue before the sector will be secured. And all must be done quickly; if you are too slow, the invincible DRACONIAN will surely seek you out as its next victim.

This is it — the single most impressive, awe-inspiring arcade game you can buy for your Color Computer. High-resolution graphics, awesome sound effects, four-voice music, and quality you have to see to believe! Experience the realism of DRACONIAN today!



32K MACHINE LANGUAGE

TAPE \$27.95

DISK \$30.95

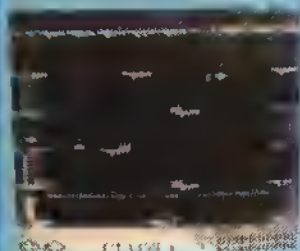
CRASH

This game is a high resolution Machine Language program with outstanding Arcade type graphics. The game consists of 4 screens. Fly the airplane over and through obstacles. Piloted by "Mario" who also appeared in "The King". The object is to conquer one screen after another but don't "Crash". Great fun for the whole family. For 1 or 2 players. Use joysticks.

32K MACHINE LANGUAGE

TAPE \$24.95

DISK \$27.95



CHAMBERS

Exciting high resolution graphics game. Multiple screens. Outstanding sound. Chambers is loosely based on Cosmic Chase. The object in each level is to destroy all of the evil creatures in each room and then go into the main reactor room and blow up the base.

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE \$24.95

DISK \$27.95



WAREHOUSE MUTANTS

Journey through the warehouse seeking out the Mutants who are out to destroy you. WATCH OUT! They will push crates trying to crush you! Outstanding realism—high resolution graphics—multiple screens.

JOYSTICKS REQUIRED

16K MACH. LANGUAGE

TAPE \$24.95

DISK \$27.95



QUIX

This one is after a popular arcade game with a similar name. Simply frustrating—you'll love it. Done in high resolution graphics with Super Sound.

JOYSTICKS REQUIRED

32K MACH. LANGUAGE

TAPE \$24.95

DISK \$27.95



MS. MAZE

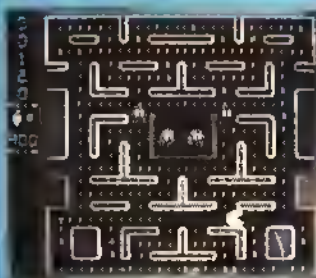
MS. MAZE is remarkable in that it combines brilliant color, high resolution, detailed graphics, and music with a very playable game. Anything that could be done to make the Color Computer look and play like the arcade version has been done. MS. MAZE is without question the closest thing to the arcade Pac games that I have seen for the Color Computer.

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE \$24.95

DISK \$27.95



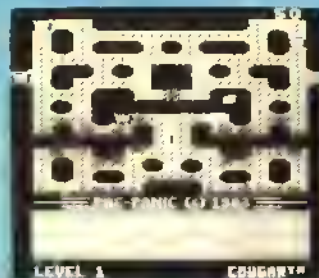
PAK-PANIC

Pakman is slain thru a maze eating dots and power pills. Pakman is pursued by four monsters who try to catch and kill him. If Pakman eats a power pill he becomes powerful and can eat monsters. Monsters try to avoid a powerful Pakman. As monsters are slain their ghosts appear on the top of the screen. When seven ghosts have appeared one will fly across the screen or they will link together forming a centipede that will travel thru the maze. Pakman has no power against ghosts and centipedes and must avoid them or be killed. JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE \$24.95

DISK \$27.95



PAK TWINS BOTH MS. MAZE & PAK PANIC FOR ONLY

44.90 TAPE
50.90 DISK



TOM MIX SOFTWARE

4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506



• ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) •
• MICHIGAN RESIDENTS ADD 4% SALES TAX •
LOOKING FOR NEW SOFTWARE

TOP ROYALTIES PAID

(616) 957-0444



QUALITY EDUCATIONAL SOFTWARE VOCABULARY MANAGEMENT SYSTEM

16K Extended basic/32K for printer output

The Vocabulary Management System (VMS) is a series of programs designed to aid a parent or teacher in helping children to learn and practice using vocabulary and spelling words. The 11 programs that comprise the VMS include a full feature data entry/edit program, three printer output programs and 5 vocabulary/spelling game programs. The system's many outstanding features include:

- As many as 300 vocabulary words and definitions may be in the computer's memory at one time.
- Words and definitions may be saved on disk or tape.
- Remarks and/or comments can be saved with word files.
- A disk loading menu allows students to load disk files without typing file names.
- Word lists may be quickly alphabetized.
- The three printer segments allow you to create and print individualized tests, puzzles, word-searches and worksheets.
- The printer segments allow full use of your printer's special features.
- The 5 game programs are based on sound educational principles and provide practice in identifying words and matching them with their definitions in a fast-paced set of activities.

TAPE \$39.95 DISK \$42.95

FRACTIONS - A Three Program Package - 32 K EXT. BASIC TAPE \$30.95 DISK \$35.95

MIXED & IMPROPER

1. Review converting mixed numerals and improper fractions.
2. Practice converting mixed numerals to improper fractions.
3. Practice converting improper fractions to mixed numerals.
4. Practice of both types. (Mixed to improper & improper to mixed)
5. Review converting mixed numerals to mixed numerals. (Used in regrouping in subtraction)
6. Practice converting mixed numerals to mixed numerals

EQUIVALENCE

1. Definitions of terms and review of finding equivalent fractions
2. Practice finding equivalent fractions
3. Practice finding sets of equivalent fractions.
4. Review of finding if one fraction is equal to, not equal to, less than or greater than another.
5. Practice finding if one fraction is equal to, not equal to, less than or greater than another.

LOWEST TERMS

1. Review of placing fractions into lowest terms by finding the greatest common factor (GCF) of the numerator and denominator.
2. Practice finding the GCF of pairs of numbers
3. Practice placing fractions into lowest terms by finding the GCF of the numerator and denominator.

TEACHER'S DATABASE

TEACHER'S DATABASE is a program designed to allow a teacher to keep a computerized file of information about his/her students. There are many features that make this program particularly attractive:

- Information on as many as 100 students (or more) may be in the computer at one time.
- Each student may have as many as 20 (or more) individual items of data in his/her record.
- The program will run from cassette or disk.
- Cassette and disk files are completely compatible.
- The program is menu driven.
- Records may be easily changed, deleted, combined or added.
- Information about students may be numerical or text.
- Records may be quickly alphabetized.
- Records may be sorted by various criteria.
- Records may be reordered (ranked) based on test scores or other data.
- Data displayed during a sort may be printed on a printer or saved on disk or cassette as a new file.
- A full statistical analysis of data may be done and sent to the printer.
- Student test scores may be weighted.

**REQUIRES 32K EXT. BASIC
TAPE \$39.95 DISK \$42.95**

ESTIMATE

ESTIMATE is a program designed to help children to practice estimating the answers to addition, subtraction, multiplication and division problems on the Color Computer. It has many features that make it use particularly attractive.

- Up to 5 students may use the program at the same time.
- There are 5, user modifiable, skill levels.
- The acceptable percent error may be changed as a student's skill improves.
- A timer measures the number of seconds used to answer each problem and the total time used for a series of problems.
- If a problem has been answered incorrectly, the student is told the percent error and asked to try again.
- If a problem is answered incorrectly a second time, the student is told the correct answer and the range of acceptable answers is displayed.
- A report is given at the end of each set of problems that includes the number of problems done, the number of problems answered correctly on the first try and the average percent error.
- The (BREAK) key has been disabled so that child will not inadvertently stop the program from running. **REQUIRES 16K EXT. BASIC**

TAPE \$19.95 DISK \$22.95

PRE-ALGEBRA I INTEGERS

INTEGERS is a series of four programs designed to give students practice in working with addition, subtraction, multiplication, division and the comparison of integers. It has many features that make a very valuable tool for introducing end/or maintaining skills.

- Up to 4 students may use the program at the same time.
- There are 9, user modifiable, skill levels.
- Students are given two opportunities to answer a problem.
- A detailed report of student performance, including number correct on first try, number wrong, total time used and percentage score, is presented at the end of a series of problems.
- The programs will run on a 16K TRS-80 Color Computer with or without disk drive.

Four distinct problem formats are presented. The first presents problems in this format: $-12 + -9 = ?$ The second program presents a problem with missing numerals in this format: $-7 - ? = 18$. The third program presents a problem with a missing sign: $8 - ?6 = 14$. The last program asks the student to determine the relationship ($=$, $<$ or $>$) between two statements $3 - 9 (??) -4 -5$.

**32K EXT. BASIC
TAPE \$28.95 DISK \$33.95**

MATH DUEL

MATH DUEL is a challenging mathematics game that pits you against the computer in a game of wits. You must use all of your knowledge of factors, multiples and prime numbers to develop a strategy that allows you to gather more numbers and thus more points than the computer.

The game is deceptively simple. You select the size of the playing field that is composed of from 0 to 100 numbers. You must then choose numbers that will give you the maximum number of points and the computer the least number of points. There are only 6 rules.

1. Any number that you chose must have at least one factor still on the playing field.
2. You receive points equal to the face value of the number that you chose.
3. The computer receives points equal to the face value of all of the remaining factors of the number that you chose.
4. All of the numbers that were awarded to you or to the computer are removed from the field.
5. The game continues until there are no numbers with factors remaining.
6. At the end the computer receives points equal to the value of all of the remaining numbers.

32K EXT. BASIC

TAPE \$24.95 DISK \$29.95

PRE-ALGEBRA II

The second **PRE-ALGEBRA PACK** is composed of two programs, **EQUATION SOLVER** AND **EQUATION DUEL**, that are designed to give students practice in using and solving equations. It has many features that make a very valuable tool for introducing and/or maintaining skills:

- In both programs students may choose the range of numerical values that will be included in the equations so that the difficulty may change as their skill increases.
- In **EQUATION SOLVER** the computer secretly generates a random equation, shows the numbers that it used in the equation and the answer and challenges the student to create his/her own equation that uses the same numbers and results in the same answer.
- In **EQUATION DUEL** the student and the computer race to see who will be the first to create an equation from the same set of random numbers.
- Both programs give detailed reports of the student's and the computer's performance in creating and solving equations including time used, score and percentage correct.

**32K EXT. BASIC
TAPE \$28.95 DISK \$33.95**



TOM MIX SOFTWARE

4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506



• **ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) •**
• **MICHIGAN RESIDENTS ADD 4% SALES TAX •**
LOOKING FOR NEW SOFTWARE
TOP ROYALTIES PAID
(616) 957-0444



For example, let's assume you're calling CompuServe's Consumer Information Service (CIS), and want to build a file that works with your Hayes Smartmodem (a very programmable modem).

First, we've got to get the modem's attention with the "AT" command, followed by the instruction to dial a number, using touch-tones.

Then, when our terminal senses that a connection has been made, we'll tell it to send a CONTROL-C to get CIS's attention, and then to answer the User ID; and Password: prompts, then return control to us.

Thus, our command file might look something like this:

```
CIS           (what we call the file)
AT DT8702461 (Dial the number)
WAIT         (Wait for connect)
$03          (Send a CNTRL-C)
>ID:         (When CIS sends "ID:"... )
71234,5678   (send our User ID)
>word:       (When CIS sends
              Pass(word);...)
DARING#BIRD  (send our password)
/TERM        (return control to
              operator)
```

The "smart" terminal program could read this file, and execute those commands just exactly as we had entered them ourselves, saving us some time, and more importantly, saving us from having to enter the same thing every day when we log on to CIS.

Other Features

While we're dreaming about what we'd like to put in our smart terminal program, let's think about what we do with all the information that scrolls off our screen.

In our dumb terminal, the data we got from the BBS was lost forever since there was no way to save it.

Aha! Let's make it possible to save anything we get in RAM, so we can look at it later. This feature of a smart terminal program is called a buffer, a temporary storage area.

But, wouldn't the data in the buffer be lost if we turned off the program, or powered-down the computer? Yep, it would, so we'll also include a method by which we can save all or a portion of the buffer to disk or tape, OK?

Receiving data from some other source, such as transferring a program from CompuServe to your own system, is known as "downloading." You can download to a printer, too. So that gives

us "DOWNLOAD TO TAPE, DISK OR PRINTER."

What happens, though, if you're on a BBS for an hour, reading messages and looking through the available information, and all you really want to print out is one or two messages?

Ideally, our buffer should be able to be opened and closed two ways. The first method would be under manual control — you decide what you want to save, and what you don't want to save.

Additionally, there are times when the computer should know that you want to save what it's going to send in the next little bit, so there should also be "AUTOMATIC BUFFER CONTROL."

In the world of telecommunications, there have been some unofficial standards set, and one set of those standards

which one will work as the "CLOSE BUFFER" control code.

So, in this case, we'll also include "DEFINABLE CONTROL CHARACTERS" in our list of desired features.

Let's Send It The Other Way

When you send pre-stored information to another computer, be it a BBS or a consumer-oriented information service, you "UPLOAD" the file, the opposite of "DOWNLOAD."

This can be extremely cost-effective if, for example, you're using a service where time is at a premium, or where you are charged by the minute of connect time.

Using your favorite word processor or a home-brewed message generator, you can compose messages before you

"No matter how much RAM you have in your computer, or how much you spend on the latest in 'super-techuo' autodialing, coffee-making modems, you can't do a thing with them without some sort of terminal program . . ."

says that whenever a terminal program "sees" a CONTROL-R (Hex value \$12 — or CHR\$(18)), it should OPEN the receive buffer. Conversely, when a CONTROL-T character (Hex \$14 - CHR\$(20)) comes down the line, the terminal program should CLOSE the buffer.

If the BBS you are using supports the CONTROL-R / CONTROL-T method of buffer control, you wouldn't have to open your buffer yourself when you want to download a program — just let the terminal program do it for you.

By the way, the CONTROL-R / CONTROL-T characters are also known as DEVICE CONTROL-2 and DEVICE CONTROL-4, depending on whose list of control codes you're looking at. The important thing to remember, though, is that they are the same thing, no matter what they are called.

Do all BBS and information services use CONTROL-R / CONTROL-T? No, they don't, so in our "smart" terminal that we're working on, we would also like the ability to define just which particular character will be recognized as the "OPEN BUFFER" character, and

connect your modem and have everything ready to go at the touch of a single key.

Where are you going to get the info? Again, it would be nice if you had the option of reading in a text file from either the cassette or disk, so we'll include "UPLOAD FROM TAPE OR DISK" in our list of things to have.

Are We Still Talking ASCII?

So far, we've assumed that all of our communications will be taking place using ASCII, those first 128 characters of the possible 255 that the CoCo can generate.

Is there anything besides ASCII?

Yes, and it's called binary.

Let's assume you have built a BASIC program that you want to save to disk. Normally, you would enter:

```
SAVE "PROGRAM.BAS"
ENTER
```

But, if you entered:

```
SAVE "PROGRAM.BAS",A
ENTER
```


you would save the program on disk in ASCII format.

What's the difference, since both would load into the computer and run?

BASIC uses "tokens," a one-character or two-character symbol for certain words in the BASIC command library. Thus, instead of writing "RESTORE" on a disk, BASIC normally just writes a CHR\$(143), saving six bytes on the disk. Follow that through with the whole program and you can see that tokenizing commands and keywords can save quite a bit of space in the long run.

What's that got to do with our "smart terminal program"? Look at the value of RESTORE. It's 143, above what is normally recognized in the ASCII "language."

An Apple computer, for example, wouldn't recognize that character as "RESTORE."

That's why ASCII was created, so all computers would have a common language that they could all recognize. And that's fine if we're only sending and receiving text or ASCII programs, but what happens when we want to receive a

machine language program? ML programs need the whole range of values from 0 to 255, unlike an ASCII BASIC program.

We'll have to include non-ASCII uploading and downloading in our program then, and that will require the ability to send and receive eight data bits, since seven data bits are normally used on most BBSs and information services.

binary 1 1 1 1 1 1 1 = 128
1 1 1 1 1 1 1 = 255

That means we need to be able to set "COMMUNICATIONS PARAMETERS." Normally, besides the data length of a "word," most full-featured terminal programs also allow you to specify the speed at which the data will be sent (300 and 1200 Baud are the most commonly used), the number of "stop bits" in a data word, as well as parity.

Parity is used to help insure a good transmission of data, and is used to verify that the proper data was sent.

Even parity means that the sum of all the bits in the "word" being sent will be equal to an even number. If the result of just the data is an odd number, an extra

"1" value will be added to the word to bring the total value up to an even number.

For example, in a seven-bit word:

1 0 0 1 1 0 0
(1) (2) (3) (4) (5) (6) (7)

is an odd number. Since there are only three ones, even parity would make the eighth bit of the data word become another "1" and the result would be sent as:

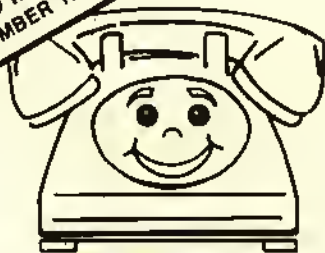
1 0 0 1 1 0 0 1
(1) (2) (3) (4) (5) (6) (7) (8)

On the other hand, the first seven bits in the next word, the data itself, adds up to an even number, so the eighth bit, the parity bit, is set to a zero, changing nothing.

0 1 1 0 1 1 0 0
(1) (2) (3) (4) (5) (6) (7) (8)

Since it depends on which parity the host computer is expecting, our terminal program needs to be able to send either even or odd parity, ignore parity entirely, or always set the parity bit to a

TOP RATINGS
HOT COCO MAGAZINE
SEPTEMBER 1984



AUTOTERM
TURNS YOUR COLOR COMPUTER INTO THE
WORLD'S
SMARTEST TERMINAL!
YOU'LL ALSO USE AUTOTERM FOR SIMPLE
WORD PROCESSING & RECORD KEEPING



NOW HI-RES

EASY TO USE

ON-SCREEN EDITING via cursor. Full prompting and error checking. Key Beep and Error Beebop. Scroll bkwd/fwd while on line. Save/load files while on line. Maintain a disk copy of session. Automatic graphics. Memory bank switching. True lower case. Screen widths of 32, 40, 42, 50, 64. No split words on screen/printer. Print all or part of text. Search for strings. Well written manual goes step-by-step and has many KSM examples. Back cover is a cheat sheet.

RECOMMEND 32K to 64K
Tape-to-Disk Upgrade \$23

PLEASANTLY POWERFUL

Total communications ability, 128 ASCII chars, 1200 baud, etc. Send text, graphics, BASIC, ML. Scan/Edit current data while receiving more data. Any modem. Fully supports D.C. Hayes and others. Any printer, page size, margins, etc. Override narrow text width of received data. Examine/change parameters, KSMs and disk directories at any time. Handles files which are larger than memory.

CASSETTE \$39.95
DISKETTE \$49.95
Add \$3 shipping and handling
MC/VISA/C.O.D.

TRULY AUTOMATIC

Create, edit, print, save and load Keystroke Multipliers (KSMs). KSMs automate almost any activity. Dial via modem, sign-on, interact, sign-off. Perform entire session. Act as a message taker. KSM may include parameter changes, disk operations, editing, time delays, looping, execution of other KSMs, waiting for part-specified responses, branching based upon responses.

PXE Computing
11 Vicksburg Lane
Richardson, Texas 75080
214/699-7273

"1", or always set it to a "0".

Is Parity Foolproof?

Unfortunately, parity is not foolproof, and a noisy telephone line can do horrendous things to the 32K worth of BASIC program you just downloaded from your favorite BBS.

With that in mind, let's add an "ERROR-CHECKING and ERROR-CORRECTING PROTOCOL" to our terminal program, so we can be sure to get the most out of our online time.

A protocol is merely a set of rules; in this case, the rules by which an accurate transfer of data will take place from one system to another. Several such protocols exist for the Color Computer today.

In the general world of microcomputers, perhaps the most popular error-checking protocol is known as "XMODEM."

XMODEM was created in 1982 by Ward Christiansen, founder of the first BBS system (Ward and Randy's CBBS, Chicago, 1977 — see the list of BBSs in this issue of THE RAINBOW) and was originally written for the CP/M operating system.

It works like this:

The sending computer loads in the file, be it a BASIC program, a machine language program, or a text file (it doesn't matter to XMODEM), and looks at the first 128 bytes of the file.

It adds up all the values in the first 128 bytes, and remembers that number, called a checksum, just like *Rainbow Check Plus* used here in THE RAINBOW to make sure you typed the correct information into your computer (See the "Rainbow Info" page).

When the receiving computer is ready, it sends a signal to the sender which starts throwing the data out, one byte at a time. Following the last byte of data, the sender adds the checksum it computed earlier.

The receiving computer, while all this is going on, is also keeping track of what it has received, and computes its own version of the checksum.

If the two checksums agree, the receiver signals the sender that all is well, and to continue.

If the checksums are not equal, though, the entire block of 128 bytes of data is re-sent, and the process is repeated.

This way, you're sure that what you sent is what the other end received, and

vice versa — error-checking and error-correcting.

The popularity of XMODEM comes into play when you consider that it is the standard file transfer method on the majority of BBS systems that offer any sort of error-checking and error-correcting protocol.

For the TRS-80, the popular TBBS Bulletin Board program supports XMODEM, as does a recently announced BBS program for the CoCo, *COBBS*.

Is XMODEM Standard?

There are many other error-checking protocols in use, and unfortunately, most of them are not compatible with each other.

DFT (Direct File Transfer) for the TRS-80 series of computers (Model I, Model III/4 and CoCo), for example, uses a 256-byte block of data, and a different series of commands between the sender and receiver.

For CompuServe users, CIS offers not one, but two error-checking protocols of its own design, the CompuServe "A" protocol, and the CIS "B" protocol that's used in CIS's CoCo

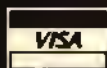
CINSOFT

For COCO...in the Midwest
PROGRAMS • PERIPHERALS • SUPPLIES • SERVICE
Since 1982 Now in our 3rd year



Free gift with any order placed on our exclusive "Electronic Shopping Service."

• Call •
513-396-SOFT



• Write •
2235 Losantiville
Cincinnati, OH. 45237

• Shop by Modem •
513-396-SHOP
COD

SHIPPING will be charged at our ACTUAL COST
Ohio residents add 5.5% Sales Tax COD add 2.00

PROGRAMS

Buy	Save
1	10%
2	15%
3	20%

Thru Nov. 15, 1984

VIP Writer.....	68.95
VIP Terminal.....	49.95
VIP Database.....	59.95
Ellie Calc.....	59.95
Ellie File.....	74.50
Dynacalc.....	99.95
Musica II.....	39.95
Graphicom.....	29.95
Del Palcal.....	119.95
Workbench.....	119.95
Tom Mix, Mark Dala	Call

MODEMS

Volkemodem with cable	79.95
Hayes Smartmodem 300	239.00
Hayes Smartmodem 1200	549.00
Cable for Hayes.....	14.95

DISKETTES

5 1/4" SS/DD	
Ultra Magnetic.....	19.00
BASF.....	21.00
3M.....	23.00
Maxell.....	25.00
5 1/4" DS/DD	
BASF.....	25.00
3M.....	27.50

PRINTERS

Gemini 10X.....	279.00
with Melric Industries	
Interface.....	329.00
with pbb interface	359.00
Power Type, daisywheel	
.....	379.00
Serial Cable for Power Type	14.95



star

AUTHORIZED STAR-MICRONICS
* SERVICE CENTER *
We will gladly perform any
warranty or out-of-
warranty service on your
Star printer.

MONITORS

Gorilla green.....	99.00
NAP green (with sound)	
.....	109.00
Sakala green.....	109.00
Sakala color.....	289.00
Videoplus.....	24.95
Videoplus IIM.....	28.95
Videoplus IIC.....	39.95
Mark Data Video Driver	29.95

Order
Today!

VIDTEX (not *Videotex*, which is sold by Radio Shack) terminal program.

Each of the protocols has its advantages, and each has its own disadvantage, the biggest of which may be that not enough systems support that particular protocol.

What it all boils down to is that the particular protocol you will need will depend upon which protocol is in use by the host computer you call.

CompuServe's CIS, for example, has recently begun to support XMODEM in addition to its own protocols, due to the large number of terminal programs for all computers that support XMODEM.

In our "smart" terminal program wish list, then, let's assume we'll add the XMODEM protocol to the program, because of the popularity of the protocol on many BBS systems around the country.

However, if we also wanted to exchange programs with another Color Computer user, we could use almost any of the protocols available. So again, let me emphasize that the particular protocol you "need" will be dependent on what you're going to do with the

terminal program. In this case, it's best to investigate all of the possibilities.

Is That About It?

We could also add the ability to send some pre-programmed but standard sentences, display the characters on a high resolution 51x24 or 64x24 screen, instead of the 32x16 screen normally seen on the Coco, and a few of the other "bells and whistles" that make each individual terminal program different, but I think you might have a good idea of what's really needed.

And so, the bottom line: Is there any terminal program available that does everything that we could possibly want it to do?

I haven't been able to find one for the CoCo, nor for any other computer, for that matter. And, if you find one, I wish you'd let me know.

Each of the terminal programs available for the CoCo today has, in my personal opinion, its own pluses and minuses.

There are programs available that do a large majority of the things on our wish list, the major thing lacking in most terminal programs being protocol uploading and downloading.

The idea here is that you should carefully read the advertisements, write for literature, and investigate your purchase before you commit yourself to just one terminal program.

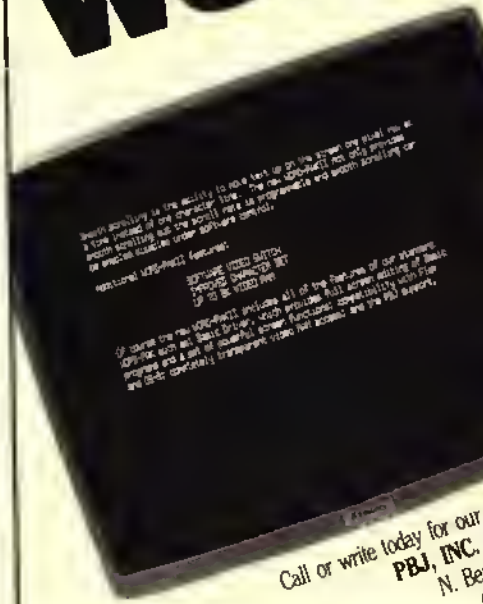
Or, you can work another strategy, and do as I do, and use several different terminal programs, each one working well for a particular application.

For example, when I'm performing my SYSOP duties on The Color SIG (Special Interest Group) on CompuServe, I may be using one of the programs that works well at 1200 Baud (not all of them do), so I can rapidly read and reply to messages, work on my system files, and maintain the SIG's database.

When I want to upload or download an ASCII text file, I may choose a different program, one that only runs at 300 Baud, but is easy to use to upload and download files. And, when I'm working with a binary file, like a machine language program or a graphics screen, I probably will use a third terminal program.

So, as you can see, the terminal program, or programs, you choose are vitally important, and you should make your purchase decisions wisely.

INTRODUCES **WORD-PAKII** now even MORE advanced.



- The ultimate WORD-PAK is now available. The new WORD-PAKII includes all of the features found on our standard WORD-PAK plus ...
- **SMOOTH SCROLLING:** Smooth scrolling is the ability to scroll the display off the screen one pixel at a time instead of one character line at a time. This is a feature that is only available on terminals costing thousands of dollars and then only on some. Now you can add the same capability to your color computer. Smooth scrolling can be enabled/disabled under software control and even the scroll rate is programmable.
 - **SOFTWARE VIDEO SWITCH:** We have added a video switch to the WORD-PAKII that allows you to select either the computer's normal video output* or the WORD-PAKII's under software control. Optimized programs can now be written to take advantage of both displays ... graphics or text, and switch back and forth under software control.
 - **IMPROVED CHARACTER SET:** The characters on the WORD-PAKII are formed in an 8x10 matrix. This allows for well defined characters and full descenders. Custom character sets are also available to suit any application.
 - **8K VIDEO RAM:** We have increased the amount of video RAM available on the WORD-PAKII. The board is normally supplied with 2K of RAM and is expandable to 8K.

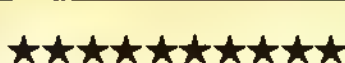
Call or write today for our NEW catalog ...
PBJ, INC. • P.O. Box 813
N. Bergen, N.J. 07047
(201) 330-1898

• **PBJ SUPPORT:** YOU CAN DEPEND ON THE SAME SUPPORT THAT HAS GAINED US THE REPUTATION OF "THE COMPANY WITH THE MOST SUPPORT FOR THE COLOR COMPUTER".



SELECTED SOFTWARE

FOR THE COLOR COMPUTER



UPGRADE YOUR COLOR COMPUTER!

Complete solderless kits with easy-to-follow instructions.

4K-16K FOR ALL BOARDS	\$19.95
4K-32K FOR ALL BOARDS	\$54.95
16K-32K FOR ALL BOARDS	\$39.95

64K For E & F BOARDS
& COCO 2

\$59.95

*IF POSSIBLE, PLEASE SPECIFY
BOARD REVISION WITH ORDER

NOTE: All ICs used in our kits are first quality 200NS Prime Chips and carry one full year warranty.

SPECIAL OF THE MONTH

JUNIOR'S REVENGE (32K)
TAPE ONLY \$21.50

THE HJL-57 KEYBOARD WITH FREE SOFTWARE FOR FOUR FUNCTION KEYS.

\$79.95

* Please specify model
(original, F version or COCO 2)

VOLKSMODEM

300 baud, direct connect, origranswer
automatically selected. Comes with all
COCO cables and battery

\$74.95

DISKETTE CAROUSEL

- Precision Rotary
- With 72 color coded envelopes.

\$29.95

BOOKS

Color Basic Unravalled	\$19.95
Extended Basic Unravalled	\$19.95
Disk Basic Unravalled	\$19.95
ALL 3 BOOKS	ONLY \$49.95

'REAL TALKER'

With enhanced software on Tape and
User's Manual

Cartridge \$59.95

'REAL TALKER II'

Same as above for COCO 2

\$69.95

Y-BRANCHING CABLE

For Disk Systems \$29.95

STAR PRINTERS

Gemini 10X	120 cps	\$279
Gemini 15X		\$399
Delta 10	160 cps & 8K buffer	\$415
Delta 15		\$549
Radix 10	200 cps & 16K buffer	\$615
Radix 15		\$715
PowerType	Disc Wheel	\$399
PBH Serial to Parallel switch selectable printer and modem interface		\$79.95
Purchased with Printer		\$59.95

MONITORS AND INTERFACE

Zenith ZVM-123 Green	\$129.95
Zenith ZVM-122 Amber	\$149.95
BMC 9191 U + medium res. w/sound	\$289.95
\$5 OFF Monitor with Video Plus purchased.	

VIDEO PLUS Color or monochrome for COCO	\$24.95
VIDEO PLUS II C Color for COCO 2	\$39.95
VIDEO PLUS II M Monochrome for COCO 2	\$26.95

TAKE 20% OFF ANY SOFTWARE ORDER

All games are in 16K machine language unless noted.

TOM MIX SOFTWARE

	TAPE	DISK
* ORACONIAN (32K) Will you be the next victim?	\$27.95	\$30.95
** SKRAMBLE Challenging destroy mission.	\$24.95	\$27.95
* CRASH (32K) Mario is back again!	\$24.95	\$27.95
* WORLOS OF FLIGHT (32K) Super realistic.	\$29.95	\$32.95
* SR-71 (32K Ext. Basic) A must for the adventurous.	\$28.95	\$31.95
* TOUCHSTONE (32K) Excellent graphics.	\$27.95	\$30.95
* BUZZARD BAIT (32K) Just outstanding!	\$27.95	\$30.95
* TRAP FALL Just like Pitfalls.	\$27.95	\$30.95
* THE KING (32K) Just outstanding!	\$26.95	\$29.95

SPECTRAL ASSOCIATES

* GALAGON (32K) Truly state-of-the-art.	\$24.95	\$28.95
* COLOR PANIC (32K) Excellent.	\$24.95	\$28.95
* CUBIX (32K) Outstanding with 16 skill levels.	\$24.95	\$28.95
** FROGIE (32K) The best of its type.	\$24.95	\$28.85
* LUNAR ROVER PATROL (32K) Just outstanding.	\$24.95	\$28.95
GEOGRAPHY PAC Excellent learning tool with 4 color hi-res. maps. Extended Basic required.	\$32.95	—
* LANCER (32K) Excellent Joust-type game.	\$24.95	\$28.95
* MS. GOBBLER (32K) Outstanding with 4 different mazes and 16 skill levels.	\$24.95	\$28.95
* WHIRLYBIRO RUN Excellent.	\$24.95	\$28.95
* GHOST GOBBLER Highly rated Pac Man type with 16 skill levels and lots of action.	\$21.95	—

INTRACOLOR

** INTRACOLOR GRANO PRIX Exciting racing game.	\$34.95	\$34.95
** WILLY'S WAREHOUSE (32K) Excellent graphics & sound.	\$34.95	\$34.95
** CANOY CO. (32K) Can you save O.P. Doll? Over 1000 frames.	\$34.95	\$34.95
** COLORPEDE Just like the arcade.	\$29.95	\$34.95
* ROBOTACK Just like the arcade.	\$24.95	\$27.95

DATA SOFT

* ZAXXON (32K) Sega's official version.	\$39.95	\$39.95
** FOOTAN (32K) Konami's official version. Tape & disk included.	\$29.95	
** MOON SHUTTLE Nichibutsu's official version. Tape and disk included.	\$29.95	

COMPUTERWARE

	TAPE	DISK
* JUNIOR'S REVENGE (32K) Exciting!	\$28.95	\$31.95
* GRAN PRIX (32K) Challenging race.	\$21.95	\$24.95
* OOOOLE BUG Just like Ladybug.	\$26.95	\$29.95

ANTECO SOFTWARE ROMPAK ONLY

* 8-BALL For the pool-table lover.	\$29.95
* GHOST GOBBLER by Spectral Associates	\$26.95
* WHIRLYBIRO RUN by Spectral Associates	\$26.95

ADVENTURE INTERNATIONAL

SAICON: THE FINAL DAYS The most truly unique adventure ever.	\$24.95	—
ADVENTURELAND Wander through an enchanted realm and try to recover the 13 lost treasures.	\$19.95	—
EARTHQUAKE You will fear for more than your own life.	\$24.95	—
** SEA DRAGON (32K) Outstanding underwater thrills and chills.	\$34.95	—

UTILITIES AND APPLICATIONS

RAINBOW SCREEN MACHINE	\$29.95	\$32.95
SUPER SCREEN MACHINE	\$44.95	\$47.95
TELEWRITER-64	\$49.95	\$59.95
MASTER DESIGN	—	\$34.95
PRO-COLOR-FILE *ENHANCED*	—	\$79.95
COLORCOM/E Rompak or Disk		\$49.95
CCEAO	\$ 6.95	—
64K DISK UTILITY	—	\$21.95
TAPE UTILITY	\$24.95	\$24.95
MULTIPAK CRACK	—	\$24.95
HOME BASE	—	\$49.95
WORK BASE I	—	\$64.95
WORK BASE II	—	\$79.95

* Requires Joystick

** Joystick Optional

WE PAY POSTAGE on all orders in the United States & Canada. Overseas please add \$3.00. (MN Res. add 6% sales tax.)

We accept Visa, Mastercard, check or money order. U.S. funds only for foreign orders. C.O.D. please add \$2.00

Send to: **SELECTED SOFTWARE, P.O. Box 32228, Fridley, MN 55432**

24 HOUR ORDER LINE
(612) 757-2439

The Gateway To Adventure

Reality expands to fill the available fantasies.

— Laran Stardrake

By Bob Albrecht and Ramon Zamora
Rainbow Contributing Editors

"School Is In The Heart of a Child" is for parents of quite young children. We want to help you work and play with your three- to eight-year-old child and learn to use computers as a joyful family experience. We want to suggest ways to incorporate the home computer as another means to encourage your child's independence, growth, and control over his own life. See the pride on her face as she directs the computer to do what she with deliberation selects. See her head gears switch to "on" as she progresses step-by-step with your presence and caring direction.

We will explore (we hope, with your help) the following:

- Specific "teaching" techniques so that the discovery can be the child's own.
- Critical evaluation of software based on extensive playtesting in family and related environments.
- Additional resources to consult: books, magazines, software publishers, networks, etc.
- Suggestions for interludes and fun times away from the computer (a must): call the librarian for specific information; watch a TV program together and discuss it; work together as volunteers in a community project; take a spring (or fall or winter or summer) awareness walk . . .
- Whatever we learn from families we work with in Menlo Park or from you, our readers. Let's pool our knowledge. Let's share our experiences as we all learn from our children.

We also provide small programs you can type in and use right now.

Copyright© 1984 by DragonQuest, P.O. Box 310, Menlo Park, CA 94026.

(Well-known author Bob Albrecht also writes the "Game Master's Apprentice" feature for *The Rainbow* each month. Ramon Zamora is author and co-author of several books, co-founder of ComputerTown USA!, and currently designing computer games for kids at Child Ware Corp. in Menlo Park, Calif.)

We are looking, mostly in vain, for *easy-to-play* Adventure games rated G. We are tired of games that depend on killing as the way to success. So we are happy to recommend an Adventure game for you and your child. Sheri Bakun reports on her first experiences with *MYHOUSE*, one side of *Adventure Starter* from Owls Nest Software:

MYHOUSE is a game that you and your child can enjoy playing together. A text Adventure designed for the young player, it is a fun introduction to this type of game for players of any age. Adventure games are very popular with adults and until recently there were none available for young children.

In an Adventure game, the player explores a world — real or fantasy — in search of a goal, usually some type of hidden treasure. This world can be as simple as a house, as in *MYHOUSE*, or as complicated as a whole galaxy. It may take a few hours or several months to reach the Adventurer's goal.

MYHOUSE takes a few hours to solve and will interest children six and up. It is a game you can play one day, and return to later using what you have already learned.

After loading *MYHOUSE*, you see:

WELCOME TO MY HOUSE. YOUR OBJECT
IS TO FIND A HIDDEN GOLDEN COIN
AND RETURN TO THE FRONT PORCH

—GOOD LUCK!—

HIT ANY KEY WHEN READY

IF THEY'VE BEEN GOOD...

**GIVE 'EM A COLOR COMPUTER 2
AND SAVE \$20**



**16K Extended
BASIC**

13995
28-3138
Reg. 159.95

**16K Standard
BASIC**

9995
28-3124
Reg. 119.95

USE YOUR
CITILINE CREDIT

Have a Colorful Christmas

A perfect gift for the whole family that will keep on giving for years to come! The Color Computer 2 is ideal for anybody who wants to enjoy games in a system that can be used for many other household, business and educational tasks. It's great for beginners who want a computer to learn on—but won't limit them later on. And it's perfect for hobbyists who want a full-featured system with the opportunity for advanced graphics and programming expansion.

Ready to Use

Just attach the Color Computer 2 to any TV. Our "pop-in" Program Pak™ cartridges let you battle starships in outer space, run a maze, play baseball—and lots more. But playing games is only the beginning. You can set up a budget or monitor your investments. Your kids can learn math or typing, enjoy literary classics or make glorious computer "paintings"

Want to Learn to Program?

Our entertaining instruction manuals will have you writing programs with color displays and sound in no time. Color BASIC's simple commands let you quickly produce drawings, diagrams and charts. Choose from eight brilliant colors, create musical tones, solve problems, analyze data and much more.

Choose the Color Computer That's Right for You

The 16K Color Computer 2 with the Standard Color BASIC language is perfect for beginning programmers. An entertaining 185-page learning manual is included. Or pick the 16K Color Computer 2 with Extended Color BASIC for advanced programming capabilities. Create high-resolution color graphics using simple one-line commands. You can even choose the Standard version and upgrade to Extended BASIC later on.

Expand Easily

Your Color Computer 2 can grow with you, too. Add a pair of joysticks, a printer and a modem for telephone communications. Upgrade with more memory and up to four disk drives, too.

IF THEY'VE BEEN REALLY GOOD...

**GIVE 'EM THE WORKS
AND SAVE \$117.70**

Complete System

299⁹⁵

Reg. Separate Items 417.65

**AS LOW AS \$27 PER MONTH
WITH CITILINE CREDIT**

Get Super Holiday Savings On This Versatile System!

Save big when you get this perfectly matched Standard Color Computer 2 system, with advanced color graphics printer and cable, cassette recorder, joysticks and educational programs!

Get Beautiful Color Printouts in Seconds

The ultra-compact CGP-115 Color Graphics Printer lets you create a variety of graphic designs from charts to computer-generated "doodles." The CGP-115 uses easily replaceable ink cartridges to

print in brilliant red, blue, green and black on 4 1/2" wide paper. Drawing and plotting are simplified with CGP-115's built-in commands.

Save Programs and Data on Cassette Tape

The CCR-82 recorder is especially designed for loading and recording programs and data. The CCR-82 features a volume control with a pre-set marker that makes it easy to find the right setting, time after time.

Increase Your Children's Vocabulary Skills

You also get our popular Vocabulary Tutor programs on cassette tape—the fun way to learn new words. Kids in grades 3-5 can match words with their definitions and place the words in appropriate sentences.

Come In Today!

Take advantage of either of these super holiday offers at your local Radio Shack. A Color Computer 2 is one present that will pay off in the future—for everyone in the family!

Radio Shack®
The Technology Store™

A DIVISION OF TANDY CORPORATION

New 1985 Computer Catalog. Send me a free copy.

Mail To: Radio Shack, Dept. 85-A-455
300 One Tandy Center, Fort Worth, Texas 76102

NAME _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
TELEPHONE _____

Prices apply at Radio Shack Computer Centers and participating Radio Shack stores and dealers. Offer good from 10/15/84 through 12/31/84.

You explore the house by typing one- or two-word commands. The vocabulary available is limited and part of the challenge of Adventure games is discovering new words that will be "understood." The computer responds to your commands in three ways: by telling you it doesn't understand the request; by performing the appropriate action; or by telling you it is unable to do what you ask. For example, the computer might ask, "WHAT SHOULD I DO?" If you type "OPEN DOOR," the response may be "IT'S LOCKED" or "OK, IT'S OPEN."

The computer understands words such as "GET," "OPEN," "LOOK" and "READ." Whenever you type "LOOK," the computer responds by telling you where you are, what you see, and in which directions you may go.

Movement is specified by the compass directions north, south, east, and west, and by up and down. When exploring *MYHOUSE* with your child, you may wish to make a map of the house. Mark the starting point in the center of a large sheet of paper. Using standard map notation, north will be at the top. We suggest that as each new room is entered, you and your child discuss where on the map that room should be drawn. It is also helpful to write down what you see in each room for future reference.

Our six- and seven-year-old playtesters found that spelling and typing slowed down their exploration. Try taking turns being typist to ease this frustration. Or maybe you can type the two-word commands and your child the shorter ones. [Laran Stardrake says: "Dual mode — Play together. Let the child tell you when she or he wants solo mode, trying it alone."] *

MYHOUSE provides an introduction to map making and practice in the skills of logical thinking and deductive reasoning. It is also fun to play, and children like to solve the mystery more than once. Eventually you and your child will want to try the more challenging *Pirates Adventure* on the other side of the cassette.

* Thanks, Dr. Thomas Dwycr, for teaching all of us about dual mode and solo mode in your pioneering projects.

We encourage all of you who want to try an easy Adventure game with your kids to get this Adventure and do it. Please share your experiences with us. We will continue playing *MYHOUSE* with kids and share our experiences with you. Why do we choose *MYHOUSE*? Because it is the only *nonviolent, easy-to-play* Adventure game we know of for a 16K CoCo with Extended Color BASIC.

(*Adventure Starter* from Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363. For 16K Extended Color BASIC. On cassette for \$17.95 postpaid)

Special Kudos!

Owls Nest encourages you to make backup copies of the two Adventure games in *Adventure Starter* and tells you how to make them.

WANTED: Nonviolent, easy-to-play Adventure games. We especially want games suitable for parents and young child to play together. Why do all you Adventure game-designers spend your time making increasingly more difficult games for the "elite" and "sophisticated" player? The world is full of beginners. Why not make beautiful games for them? Instead of selling 1,000 incredibly complex games to the Adventure game cult, why not sell 100,000 beautiful, nonviolent games to beginners?

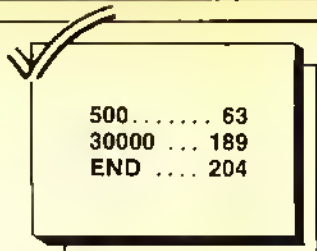
WANTED: Nonviolent Adventure games with several levels of play. A beginner starts with an easy game and is guaranteed moderate success, then moves up to a more difficult level, and so on. Focus on exploration and problem-solving instead of "kill monster, get treasure." Make your games realistic fantasies. (As Laran Stardrake once said, "Reality expands to fill the available fantasies.")

We will expand on this in future episodes of "School Is In The Heart Of A Child." We will suggest Adventure game environments and scenarios dear to our hearts. We will gladly give away ideas to any cottage company that wants to help create wonderment for children. We would love to playtest nonviolent Adventure games for all you publishers and help you bring to people the next generation of Adventure games, the games for "the rest of us."



Guess My Word

Sheri Bakun and her kids played last month's *Guess My Word* game. They offer a replacement for block 600 to make the game easier and more fun to play. In case you missed our last episode, here is the complete listing of the program, including the new block 600.



500.....	63
30000 ...	189
END	204

The listing:

```

100 REM**GUESS MY WORD SCH 9-1
110 CLEAR 2000: DIM WORD$(200)
120 CLS
130 PRINT "GUESS MY WORD GAME"
140 PRINT
150 PRINT "I'M MEMORIZING WORDS."
"
199 "
200 REM**READ & COUNT WORDS
210 NW = 0
220 NW = NW + 1
230 READ WORD$(NW)
240 IF WORD$(NW)<>"***" THEN 220
250 NW = NW - 1
299 "
300 REM**TELL HOW TO PLAY
310 CLS
320 PRINT "I'LL THINK OF A 3-LET
TER WORD."
330 PRINT "MY WORD IS BETWEEN AA
A AND ZZZ."
340 PRINT
350 PRINT "MY LOWEST 'WORD' IS A
AA."
360 PRINT "MY HIGHEST 'WORD' IS
ZZZ."
370 PRINT: PRINT "PRESS ANY KEY
AND WE'LL PLAY";
380 XX = RND(NW): IF INKEY$=""
THEN 380
390 PRINT
399 "
400 REM**PICK A RANDOM WORD
410 RW = RND(NW): W$ = WORD$(RW)
499 "
500 REM**GET GUESS
510 PRINT: INPUT "YOUR GUESS";G$
599 "
600 REM**IF INCORRECT, GIVE CLUE
610 IF G$=W$ THEN 710
620 W1$ = LEFT$(W$,1)
630 G1$ = LEFT$(G$,1)
640 D = ABS(ASC(W1$) - ASC(G1$))
650 IF D=0 AND G$<W$ THEN PRINT
"YOU ARE HOT! TRY A HIGHER WORD.
": GOTO 510
655 IF D=0 AND G$>W$ THEN PRINT
"YOU ARE HOT! TRY A LOWER WORD."
: GOTO 510

```

```

660 IF D<5 AND G$<W$ THEN PRINT
"YOU ARE WARM. TRY A HIGHER WORD
.": GOTO 510
665 IF D<5 AND G$>W$ THEN PRINT
"YOU ARE WARM. TRY A LOWER WORD.
": GOTO 510
670 IF G$<W$ THEN PRINT "YOU ARE
COOL. TRY A HIGHER WORD.": GOTO
510
675 IF G$>W$ THEN PRINT "YOU ARE
COOL. TRY A LOWER WORD.": GOTO
510
699 "
700 REM**WINNER!
710 CLS
720 PRINT "THAT'S IT! YOU GUESSE
D MY WORD."
730 FOR K=1 TO 50
740 : SP = RND(507)
750 : TN = RND(255)
760 : PRINT @SP, W$;
770 : SOUND TN, 1
780 NEXT K
799 "
800 REM**TELL HOW TO PLAY AGAIN
810 PRINT @44B, CHR$(30)
820 PRINT @4B0, "TO PLAY AGAIN,
PRESS SPACE" CHR$(30);
830 K$=INKEY$:IF K$="" THEN 830
840 IF K$=" " THEN 310 ELSE 830
899 "
30000 REM**WORD LIST
30100 DATA AOD,AGE,AIR,ALL,AND
30110 DATA ANT,ANY,ARE,ARM,ASK
30200 DATA BAD,BAG,BAT,BED,BEE
30210 DATA BIG,BOW,BOX,BOY,BUS
30220 DATA BUT,BUY
30300 DATA CAN,CAP,CAR,CAT,COW
30310 DATA CRY,CUP,CUT
30400 DATA DAY,DIE,OIG,DOG,DOT
30410 DATA DRY,DUG
30500 DATA EAR,EAT,EGG,END,EYE
30600 DATA FAN,FAR,FAT,FEW,FIT
30610 DATA FIX,FLY,FOX,FUN,FUR
30700 DATA GAS,GEE,GET,GNU,GOT
30800 DATA HAT,HAY,HEN,HER,HIM
30810 DATA HIP,HIS,HIT,HOP,HOT
30820 DATA HOW,HUG
30900 DATA ICE,IMP,INK,ITS
31000 DATA JAM,JAR,JET,JOB,JOG
31100 DATA KEY,KID
31200 DATA LAY,LEG,LET,LID,LIE
31210 DATA LOT,LOW,LUG
31300 DATA MAD,MAN,MAP,MAY,MIX
31310 DATA MOP,MUG
31400 DATA NAP,NET,NEW,NOO,NOT

```

```

31410 DATA NOW, NUT
31500 DATA OOO, OFF, OLO, ONE, OUR
31510 DATA OUT, OWN
31600 DATA PAL, PAN, PAT, PAY, PEA
31610 DATA PEN, PET, PIE, PIG, PIN
31620 DATA POT, PUT
31800 DATA RAN, RAT, RAW, REO, RUB
31810 DATA RUG, RUN
31900 DATA SAD, SAT, SAW, SAY, SEA
31910 DATA SEE, SET, SEW, SHE, SIP
31920 DATA SIT, SIX, SKY, SON, SUN
32000 DATA TAG, TAN, TAP, TAX, TEA
32010 DATA TEN, THE, TIE, TOE, TOO
32020 DATA TOP, TOY, TRY, TUG, TWO
32100 DATA UFO, USE
32200 DATA VAN, VOW
32300 DATA WAG, WAS, WAY, WEB, WET
32310 DATA WHO, WHY, WIN, WON
32500 DATA YAK, YAP, YES, YOU
32600 DATA ZAP, ZEN, ZOO
32700 DATA ***

```

Block 600 computes the ASCII code of the first letters in WS and GS, then computes the distance (D) between these letters. If the first letters in the CoCo's secret word and the player's guess are the same, the CoCo tells you "YOU ARE HOT!" and which way to go (Lines 650 and 655). If the letters are not the same, but within four letters, CoCo says "YOU ARE WARM" and tells you which way to try (Lines 660 and 665). If the first letter of the guess is five or more letters from the first letter of CoCo's word, Lines 670 and 675 tell you "YOU ARE COOL" and tell you which way to go.

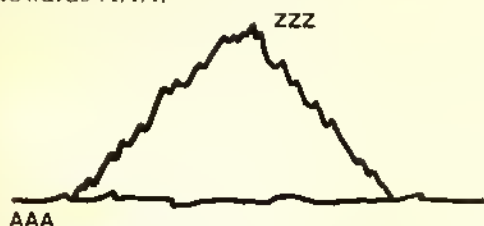
We encourage you to let the child play and discover these things herself.

Here are more variations of *Guess My Word*. You can modify our program to use different kinds of hints.

— Instead of "YOU ARE HOT" or "YOU ARE WARM" or "YOU ARE COOL," use a stripe of color. Use red for hot, orange or yellow for warm, blue for cool . . . or pick your own colors.

— Use sound as a clue. The closer the guess is to the word, the higher the sound. Or, if you prefer, the closer you are, the lower the sound.

— You could also use a sequence of sounds to tell people which way to go. Rising sounds mean go up the mountain towards ZZZ. Descending sounds mean go down the mountain towards AAA.



Reverse Strategies

First, here are the answers to the questions from last time's problems. We asked you to complete the reversing of 4 3 2 5 1 in three or more reversals.

Start:	4 3 2 5 1	
Reverse 3:	2 3 4 5 1	
Reverse 4:	5 4 3 2 1	
Reverse 5:	1 2 3 4 5	DONE.

Here are our solutions to the other four problems.

- | | | |
|--------------------|-----------|-------------|
| (1) Start: | 5 4 3 2 1 | |
| Reverse 5: | 1 2 3 4 5 | One move. |
| (2) Start: | 4 5 3 2 1 | |
| Reverse 2: | 5 4 3 2 1 | |
| Reverse 5: | 1 2 3 4 5 | Two moves. |
| (3) Start: | 2 1 4 5 3 | |
| Reverse 4: | 5 4 1 2 3 | |
| Reverse 5: | 3 2 1 4 5 | |
| Reverse 3: | 1 2 3 4 5 | Three moves |
| (4) First method. | | |
| Start: | 3 2 5 4 1 | |
| Reverse 3: | 5 2 3 4 1 | |
| Reverse 5: | 1 4 3 2 5 | |
| Reverse 2: | 4 1 3 2 5 | |
| Reverse 4: | 2 3 1 4 5 | |
| Reverse 2: | 3 2 1 4 5 | |
| Reverse 3: | 1 2 3 4 5 | Six moves. |
| (4) Second method. | | |
| Start: | 3 2 5 4 1 | |
| Reverse 2: | 2 3 5 4 1 | |
| Reverse 4: | 4 5 3 2 1 | |
| Reverse 2: | 5 4 3 2 1 | |
| Reverse 5: | 1 2 3 4 5 | Four moves. |

For a list of five numbers, you can *always* do it in (at most) seven moves. Usually, you can do it in fewer moves. For the same list, try several ways and do it in as few moves as possible. In general, for a list of N numbers (1 to N scrambled), you can put the list in order in (at most) $2N-3$ moves. But try to do better!

Try six numbers. You can do any list in $2 \times 6 - 3 = 9$ moves or less. Try for less!

(1) 4 1 3 6 2 5 (2) 3 6 2 4 5 1

Next, try seven numbers in $2 \times 7 - 3 = 11$ moves or less.

(3) 1 4 7 2 5 3 6 (4) 2 7 4 6 3 1 5

Any program to let you play REVERSE should have the option of trying the same list again or getting a new list.

We Love The Letters!

We especially love this one from Mike Knolhoff.

Dear Bob and Ramon,

Many of the parents who read your columns probably write some of their own educational programs for their young children. I would like to share an experience I had with my own young daughter in hopes that other parents will not make the same mistake that I did.

One of the most important reasons why my wife and I bought our CoCo nearly three years ago was to help educate our young children. Our oldest child at that time was three years old. One of the first programs I wrote for her was a counting game which put a random number (one through nine) of colored boxes on the

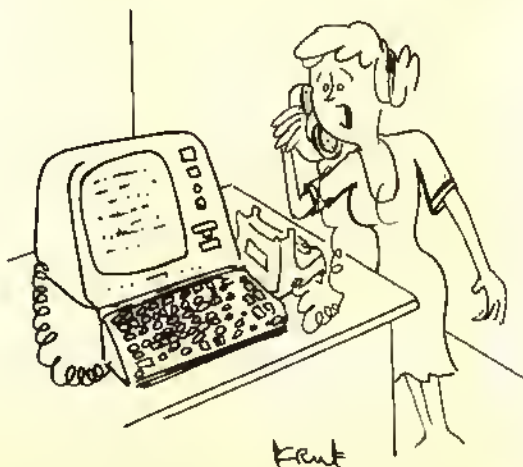
screen. She would count the boxes and press the correct number on the keyboard. If she pressed the correct number key, she was greeted by an eye-blinking smiley face and a happy tune to let her know she had pressed the right key. If she was wrong, however, she got a low tone and a frowning face.

At first she played the game with quite a bit of enthusiasm. But soon she started hiding her eyes each time she got a wrong answer to avoid seeing the frowning face. Each time she sat at the computer to play the game she became more and more fearful of getting a wrong answer. She wouldn't want to press the ENTER key, if she wasn't completely certain she had the right number. After a while she quit playing the game altogether. No matter how much my wife and I explained that it was all right to make mistakes, it didn't matter. She did not want to risk failure again. Not only did she not want to play that particular game, she became fearful of all computer games. For a long time she did not want to play any computer games. By that time I had removed the frowning face from the counting program, but still she would not play the game. Now my daughter is five and is starting to get interested in the computer again, thanks to LOGO. She still has reservations about using the computer and is still fearful of doing something wrong, but she is rapidly gaining confidence again.

The moral of this letter for all your readers is that *no* feedback on incorrect answers is better than *negative* feedback. For the very young computer users at home it's better to simply ignore incorrect answers and wait for the correct answer to be given than to provide any type of visual or audio feedback for them. By the way, my two-and-a-half-year-old son is just starting to use the counting program (without the frowning face) and seems to be enjoying it!

Sincerely,
Mike Knolhoff

P.S. Ramon, I enjoyed your chapter, "The Pedagogy of Games," in *Intelligent Schoolhouse*. I would recommend that all educators and any parents interested in the educational uses of computers read this book which is published by Reston Publishing Company. ☺



"No, nothing much today, dear... only electronic junk mail!"

MASTER DESIGN

(C) 1984 By Derringer Software, Inc.

DOES MORE THAN JUST DRAW PICTURES

IT'S A TEXT DESIGNER

Master Design has the ability to generate lettering in the graphics mode from sizes 2 to 32 and in a wide range of styles. Size 2 offers a 42 x 22 line format while size 32 creates letters that take up over half the screen. Lettering can be skinny, bold, textured, tall, drop shadow, raised shadow and in different thickness. There's nine different settings for thickness and nine different settings for creating open lettering.

IT'S A GRAPHICS EDITOR

Take full advantage of hi-res commands including GET, PUT, CIRCLE, PCOPY, PMODE, LINE, BOX, BOX FILL, PAINT and other special features available only with Master Design. Master Design utilizes a "two cursor" concept to allow quick formatting of boxes, lines and special patterns such as dot patterns for shading and diagonal, vertical or horizontal lines for creative backgrounds. You can create designs and use the TEXT designer to label areas or place titles. You can also create mirror images of the display.

COMES WITH A SCREEN PRINT ROUTINE

Master Design comes with a 7 bit and 8 bit version of a hi-res screen print routine so no matter what your printer is, we have it covered. Works in any pmode and can print normal or reversed images.

DISK and CASSETTE I/O

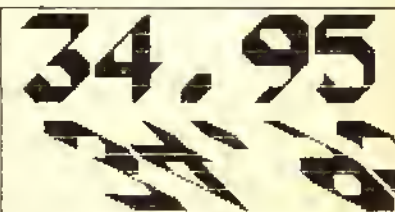
Save and load your creations to and from disk or cassette. You can even load hi-res displays created by other programs to make changes.

INTERFACES WITH TELEWRITER-64

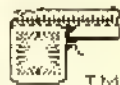
Wouldn't it be nice if you could design your own letter head in hi-res graphics and then print it out while using Telewriter-64? Master Design offers just that capability! The Letter Head Utility will let you convert any hi-res display so that it can be accessed while using Telewriter-64! The BASIC program modules are provided with step by step instructions. These BASIC modules can also be used in your own BASIC programs for printing displays without having to use the graphic pages. You can have up to 88 pages of graphics linked together for printing!



THIS IS A
SMALL EXAMPLE
OF WHAT YOU
GET FOR JUST:



**DERRINGER
SOFTWARE
INC.**



Send Check or Money Order to:
Derringer Software, Inc.,
P. O. Box 5300
Florence, S. C. 29502-2300

Visa/MC customers can call: (803) 665-5676 — 9:00 - 5:00 ed

Requires 32K with at least one disk drive
(Include \$2.00 for shipping and handling)

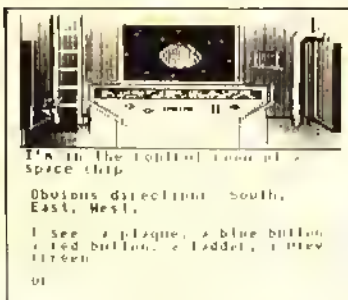
Telewriter-64 (C) 1983 by Cognitec



NEW!

Trekboer

**HI-RES
ADVENTURES**
DISC NOT REQUIRED
Cassettes — \$24.95/Discs — \$27.95



SCI-FI FANS, here it is! A new hi-res adventure even more challenging than any of our others.



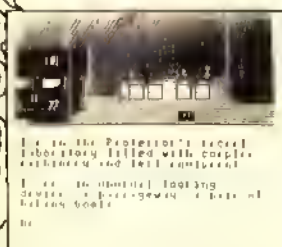
SEA SEARCH

Get your shark repellent and scuba tanks ready! The graphics in this adventure are truly outstanding and the underwater scenes are unforgettable. You'll run into a pirate, a mermaid and some hungry sharks in this colorful and unique treasure hunt. 32K required.

Hot CoCo—April '84 "The line graphics accent your imagination."

This exciting hi-res adventure begins aboard the starship TREKBOER in the 21st century. Life on Earth is threatened by a deadly virus and your mission is to search the frontiers of space and return with a cure to save mankind from disaster. But how? Where? The name of your starship provides the first clue...

Press Release "Trekboer is the latest in the collection of fine adventure games from Mark Data Products. Sure to be a hit!"



CALIXTO ISLAND

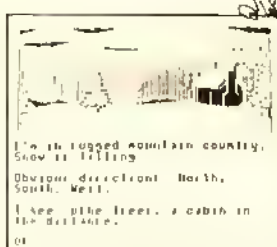
A valuable museum treasure has been stolen, can you recover it??? This is a challenging puzzle with an occasional twist of humor. You'll visit a secret laboratory, a Mayan pyramid and you'll meet crazy Trader Jack—all in living color and exciting detail. You will really love this hi-res graphic version of the classic Calixto Island Adventure. 32K required.

Rainbow—April '84 "It was enough to keep my wife and 6 year old son glued to the computer for an entire weekend and two week nights."



SHENANIGANS

Countless legends tell of a magnificent Pot of Gold hidden at the end of the rainbow. Many have attempted to find the marvelous treasure but success has eluded them and it remains hidden to this day. You, as a dedicated adventurer, have determined to search for the fabled riches and succeed where others have failed. This one is great fun! 32K required.



BLACK SANCTUM

Encounter the forces of black magic as you roam around an old 18th century monastery. You'll see all the evil locations in this spooky adventure; you'll love searching out and destroying the evil in this classic tale. A MUST for every adventure game fan! 32K required.

Rainbow—May '84 "It's the graphic screen that ate the shining stars. Some of the best I've seen."

FREE — Send for our NEW 24 page Catalog!



Mark Data Products

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

SHIPPING: All orders under \$100 please add \$2 regular, \$5 air. All orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount, please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software.

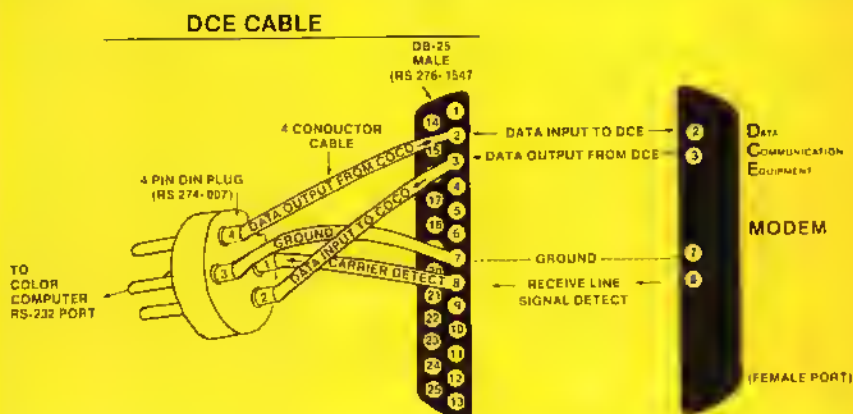
RS-232 Interface Cable for D(ata) C(ommunication) E(quipment)

I recently acquired a discarded Multi Tech Systems FM300 Data Coupler, and had naively thought that I could interface it directly to CoCo via RS cable 26-3014 (\$19.95). Wrong! As I discovered, both the computer and the modem are, by EIA (Electronics Industries Association) definition, DCE and similar equipment can be connected only through an adapter cable which interchanges various pairs of pins. The essential difference between DCE and DTE (for this discussion) is that pin 2 of the DTE is defined as a data output from the terminal, while pin 3 is defined as data input to the terminal, pin 2 of the DCE is defined as data input to the device, while pin 3 is defined as data output from the device. The RS cable was configured to connect to D(ata) T(erminal) E(quipment) . . . as I later found out, this cable worked perfectly when I connected it to an Apple II for data terminal communication.

I had two options at this point:

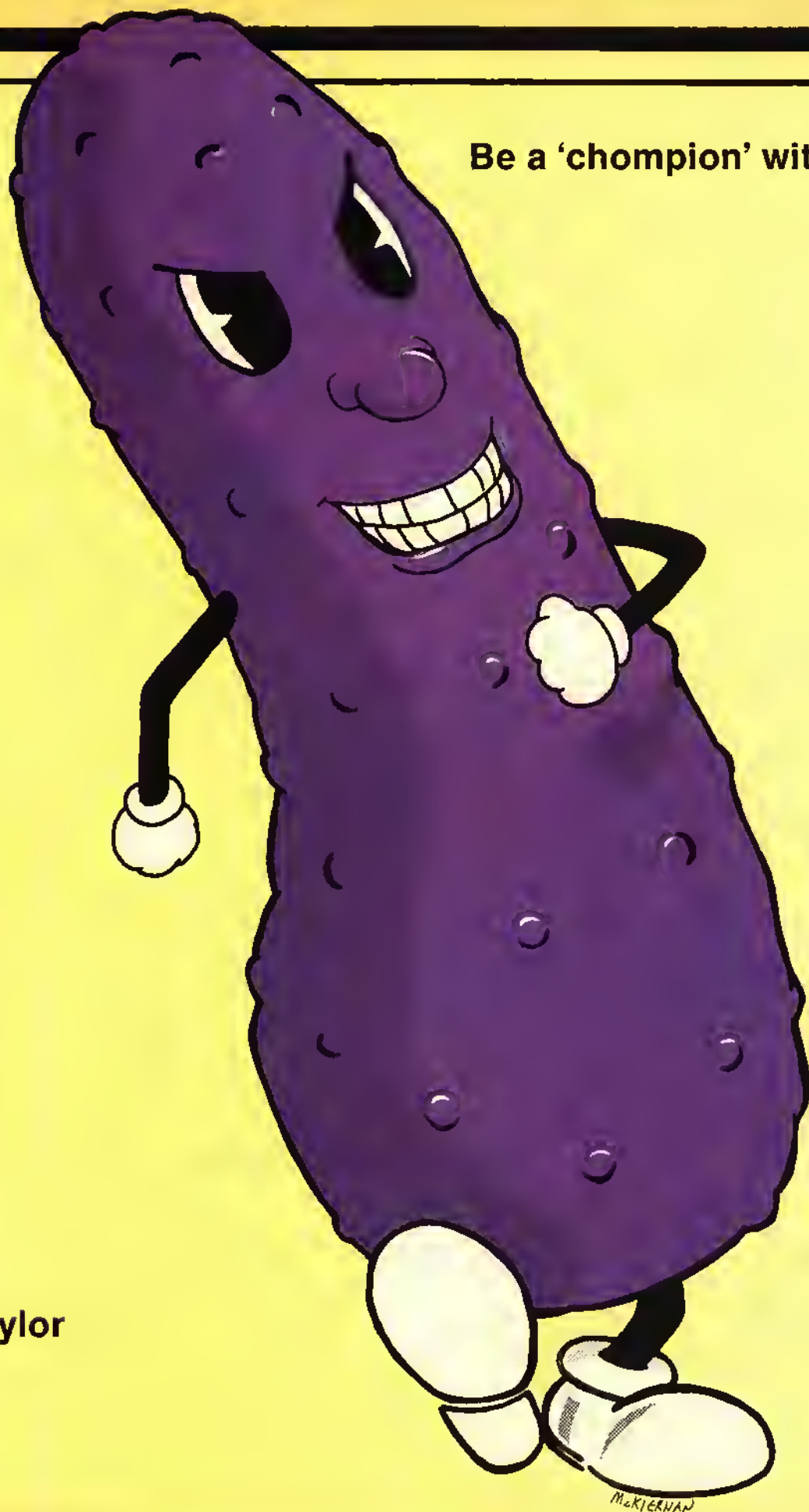
1. Reconfigure the RS cable for DCE . . . by reversing the connections between pins 2 and 3 at the DB-25 connector.
2. Make my own.

I chose to make my own. You will need a 4-pin DIN plug (RS 274-007-\$1.49), a length of 4-conductor cable, a DB-25 connector (I required a male [RS 276-1547-\$2.99]), optional hood (RS 276-1549-\$1.99). If you can't find cable, purchase RS cable #26-3020 (\$4.95) and remove one of the 4-pin DIN plugs. Note: This homemade cable cost less than \$12. I use the following cable to interface the Multi Tech Modem and an Anderson-Jacobsen Modem to my CoCo.



By Helene M. LaBonville

Be a 'chompion' with . . .



By D. Taylor

MCKERNAN



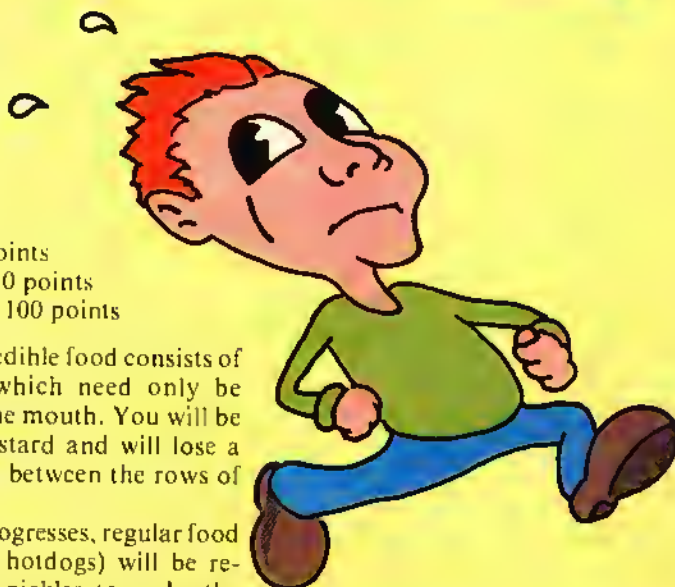
If you have a palate for some mouth-watering fun, you'll love *Junkfood*. The object of this 16K non-Extended BASIC game is to let your hungry mouth, controlled by your right joystick, eat all the "edible" foods to gain as many points as possible — but watch out for those purple pickles, they give you more than heartburn, they're deadly!

Upon execution of *Junkfood*, the title screen will be displayed. Press the right joystick fire button to begin the game. You will have three mouths, or lives, in a game. The food scrolls in rows from left to right and you must maneuver your mouth (up and down only) to chomp as much edible food as you can. Edible food and their points are:

Hotdogs - 10 points
Hamburgers - 10 points
Green Pickles - 100 points

The menu of inedible food consists of purple pickles, which need only be touched to lose one mouth. You will be squirted with mustard and will lose a mouth if you stay between the rows of food too long.

As *Junkfood* progresses, regular food (hamburgers and hotdogs) will be replaced by purple pickles to make the game more difficult. The speed will also



increase. When all regular food has been replaced and the maximum speed is reached, the game will stop momentarily and you will be rewarded 1,000 points. The round will then be reset with regular food, including green pickles, and with a few more purple pickles added between spaces of food.

If you lose a mouth in the middle of a round, the round will be reset, maintaining that level of difficulty. After losing a mouth, press the fire button to continue.

After completing *Junkfood*, the high scoreboard will appear. Your score is displayed near the top-left corner and the highest three scores will appear in

the middle of the screen. If you have a high score, the new high scoreboard will be displayed. Use the joystick to control the three initial boxes by moving the joystick to the left, to decrease the order of the letters, or to the right, to increase the order. When the correct letter is displayed, press the fire button and continue for the other two boxes. To begin a new game, press the fire button.

The program is actually in machine language, but you won't need an assembler because the four BASIC listings can be typed in directly.

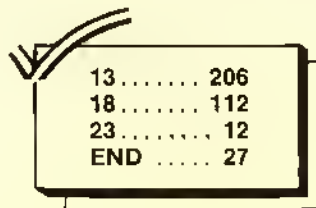
1) Type in each listing and save it to tape. Don't run them yet. (If you have this month's RAINBOW ON TAPE you can

skip this step.)

2) Now *CLOAD* each of the four listings and *RUN* them in turn. Each listing *POKEs* part of the program into memory.

3) Put in a blank tape and enter *CSAVEM "JUNKFOOD",12288,15988,12288*. This will save the machine language program onto your tape. You can now *EXEC* if you would like to play the game.

To load the game tape, just type *CLOADM:EXEC*. The finished game tape will work on a 16K CoCo with or without Extended Color BASIC. Good luck, it takes a big appetite to be a "champion!"



Listing 1:

```

1 *****
2 JUNKFDD
3 CDP. (C) 1984
4 BY DAVID TAYLDR
5 *****
6 PART#1 : RUN AND LAD PART#2
7 *****
8 FDRX=12288TD13295:READ Z:PDKEX
  Z:NEXT
9 DATA15,113,204,128,192,221,114
  ,126,56,183,16,142,128,128,142,1
  ,0,0,16,175,129,140,34,0,38,248,7
  ,183,255,199,183,255,195,183,25
  ,197,134,5,180,255,34,183,255,3
  ,142,10,44,16,142
10 DATA59,92,189,57,74,48,136,24
  ,140,11,140,38,241,204,60,158,25
  ,3,61,86,134,2,183,61,85,189,52,1
  ,97,124,61,85,189,52,197,142,11,1
  ,60,204,48,48,237,129,237,129,237
  ,132,48,136,28
11 DATA140,13,0,38,239,142,61,53
  ,16,142,62,148,16,191,59,201,236
  ,129,237,161,140,61,85,38,247,20
  ,4,22,62,253,59,210,204,60,28,253
  ,59,213,204,60,201,253,60,110,20
  ,4,60,209,253,60
12 DATA108,204,60,223,253,60,66,
  ,204,3,33,253,60,104,204,128,128,
  ,253,59,215,253,59,217,253,59,219
  ,127,59,207,127,59,238,134,48,18
  ,3,59,205,127,61,88,189,53,112,18
  ,9,56,32,126,51,60
13 DATA173,159,160,10,190,59,210

```

```

  ,166,137,1,0,129,202,38,2,134,12
  ,8,230,137,1,160,193,181,38,2,198
  ,128,193,202,38,2,198,128,16,131
  ,128,128,39,3,253,59,215,166,137
  ,1,128,230,137
14 DATA1,96,16,131,128,128,39,3,
  ,253,59,219,166,137,1,32,230,137,
  ,1,64,16,131,128,128,39,3,253,59,
  ,217,182,1,91,129,6,37,50,129,57,
  ,46,92,252,61,91,195,0,1,253,61,9
  ,1
15 DATA16,131,3,192,16,39,4,176,
  ,16,190,59,210,142,62,117,166,169
  ,1,32,230,169,1,64,237,132,166,1
  ,69,1,96,230,169,1,128,237,2,32,8
  ,9,204,0,0,253,61,91,252,11,163,2
  ,53,59
16 DATA239,16,190,59,210,16,140,
  ,12,94,39,67,49,168,224,142,62,11
  ,7,204,128,128,237,132,166,169,1,
  ,96,230,169,1,128,237,2,126,49,15
  ,8,204,0,0,253,61,91,252,11,163,2
  ,53,59,239,16
17 DATA190,59,210,16,140,31,222,
  ,39,21,49,168,32,142,62,117,166,1
  ,69,1,32,230,169,1,64,237,132,204
  ,128,128,237,2,189,49,164,126,49
  ,216,16,191,59,210,190,59,213,13
  ,4,19,183,59,212
18 DATA236,129,237,164,49,168,32
  ,122,59,212,46,244,16,190,59,210
  ,142,62,117,236,132,167,169,1,32
  ,231,169,1,64,236,2,167,169,1,96
  ,231,169,1,128,57,182,59,207,129
  ,21,39,19,124
19 DATA59,207,129,0,39,31,129,10
  ,16,39,0,12,189,54,166,126,50,22
  ,3,127,59,207,126,50,223,204,60,2
  ,8,253,59,213,16,190,59,210,126,4
  ,9,164,204,60,148,253,59,213,16,1
  ,90,59,210,189
20 DATA49,164,134,1,183,59,238,1
  ,26,53,24,127,59,238,134,3,183,59

```


, 237, 16, 142, 59, 215, 236, 161, 132, 1
43, 129, 128, 38, 14, 196, 143, 193, 128
, 38, 8, 122, 59, 237, 46, 237, 126, 50, 2
04, 189, 54, 154, 134
21 DATA3, 183, 59, 237, 16, 142, 59, 21
5, 236, 161, 132, 240, 129, 128, 38, 14,
196, 240, 193, 128, 38, 8, 122, 59, 237,
46, 237, 126, 50, 237, 204, 48, 48, 253,
62, 127, 253, 62, 129, 204, 49, 48, 253,
62, 131, 189, 50, 115
22 DATA126, 50, 204, 142, 11, 160, 16,
142, 62, 121, 189, 50, 224, 127, 59, 206
, 49, 37, 142, 62, 132, 166, 164, 171, 13
2, 187, 59, 206, 127, 59, 206, 128, 48, 1
29, 57, 46, 14, 167, 164, 16, 140, 62, 12
1, 39, 17, 49, 63, 48
23 DATA31, 32, 226, 128, 10, 167, 164,
134, 1, 183, 59, 206, 32, 233, 142, 62, 1
21, 16, 142, 11, 160, 141, 41, 49, 168, 3
2, 16, 140, 12, 224, 38, 245, 182, 11, 16
1, 177, 59, 205, 39, 3, 126, 55, 204, 57,
16, 190, 59, 210
24 DATA204, 128, 128, 253, 59, 215, 25
3, 59, 217, 253, 59, 219, 126, 49, 164, 5
7, 236, 132, 237, 164, 236, 2, 237, 34, 2
36, 4, 237, 36, 57, 204, 48, 48, 253, 62,
127, 253, 62, 131, 204, 48, 49, 253, 62,
129, 189, 50, 115, 32
25 DATA203, 204, 62, 139, 253, 59, 233

, 134, 9, 183, 59, 230, 190, 59, 221, 16,
190, 59, 233, 48, 30, 134, 15, 183, 59, 2
29, 236, 132, 237, 1, 48, 30, 122, 59, 22
9, 46, 245, 166, 160, 167, 2, 122, 59, 23
0, 46, 229, 57, 204
26 DATA0, 0, 195, 0, 1, 16, 179, 60, 104
, 38, 247, 57, 204, 33, 158, 253, 59, 221
, 189, 51, 1, 189, 48, 192, 246, 61, 85, 1
6, 39, 1, 195, 189, 53, 24, 189, 52, 112,
189, 51, 243, 182, 61, 88, 16, 46, 3, 191
, 189
27 DATA51, 47, 189, 48, 192, 246, 61, 8
5, 16, 39, 1, 166, 189, 53, 24, 189, 48, 1
92, 246, 61, 85, 16, 39, 1, 153, 189, 53,
24, 252, 59, 221, 131, 6, 128, 16, 131, 7
, 158, 39, 8, 16, 131, 10, 222, 39, 174, 3
2, 175
28 DATA204, 30, 94, 32, 170, 190, 61, 5
1, 166, 128, 167, 159, 60, 110, 140, 62,
212, 39, 35, 191, 61, 51, 129, 1, 39, 53,
129, 2, 39, 54, 129, 3, 39, 55, 129, 4, 39
, 56, 204, 60, 235, 237, 159, 60, 108, 19
5, 0, 3
29 DATA237, 159, 60, 66, 32, 68, 190, 6
0, 104, 140, 0, 1, 39, 6, 48, 136, 236, 19
1, 60, 104, 189, 53, 66, 189, 53, 66, 142
, 62, 180, 32, 196, 204, 61, 15, 32, 213,
204, 60, 68, 32, 208, 204, 60, 112, 32, 2
03, 204, 60



MASTER KEY

© 1984

*** INTRODUCTORY OFFER ***

\$99.95

Have you ever lost a program and didn't have a backup? Someone in later it happens to everyone. The best policy is to have a backup of EVERYTHING. This does the trick - many programs are copy-protected and won't backup easily. So how do you protect your investment?

The MASTER KEY was developed just for this problem. Just as a master key unlocks all doors in a building, this MASTER KEY will unlock ALL programs that use the 1000 a memory. And it's as easy as flipping a switch! Once you have control, you can copy your programs, protected or not, to tape or disk. The MASTER KEY works!

• Translate Disassembler
• Display/Change memory in Hex or ASCII
• View memory in all Graphic Modes
• Variable printer routine for All printers
• Auto-Pak mode has gold contacts for more reliable operation.
• Comprehensive, easy to follow manual

• Search for text or M/L routines
• Copy memory from one location to another
• Write memory to tape or disk
• Database All auto-start programs
• Rom-Pak feature allows use on disk systems
• While Master Key is installed,
• Works with all versions of CoCo, 161

The MASTER KEY may be used to convert any program from tape to disk, and yet does not require a background in assembly language. Using the 16THOUS version of the manual will allow even a novice to copy any program. As you learn more about assembly language, you'll be able to use the MASTER KEY's full capabilities.

You can leave the MASTER KEY plugged in all of the time. The gold contacts will improve the I/O of your disk drive, and at the flip of a switch you'll have a quality disassembler. The Erasable/Change feature will allow the entry of short M/L routines, and the Screen command will allow quick debugging of graphic screens.

90 DAY MONEY BACK GUARANTEE: If you find any program that MASTER KEY cannot save, contact us at once for a full refund.

NOTE: The MASTER KEY has been developed as an educational tool and to assist the user in analyzing and saving archival purposes programs he/she has purchased.

NOTE: The board owners must cut a capacitor - details included.

SUPPLIED ON ROM PAK MODEL MM035

BACK IT UP!

SUPER BACK-UP UTILITY*
SUPER BACK-UP UTILITY WILL PERFORM ALL OF THE FOLLOWING FUNCTIONS

1. TAPE TO TAPE (Regardless of most protection schemes)
2. TAPE TO DISK (Move Cassette programs to Disk)
3. AUTO RELOCATE (For those Cassette programs that conflict WITH Disk operating system)
4. DISK TO TAPE (Place Disk programs onto Cassette)
5. DISK TO DISK (Our powerful Spit-N-Image Program - Regardless of protection schemes)

- * MENU DRIVEN
- * REQUIRES 32K EXTENDED COCO
- * REQUIRES 1 OR 2 DRIVES (For Disk Function)
- * ALL MACHINE LANGUAGES!!!

COMPARE WITH OTHER INDIVIDUAL PROGRAMS
COSTS IN EXCESS OF \$100.00 OR MORE!!!

*** ONLY \$49.95! ***
(SUPPLIED ON DISK)

T.T.U. - TRIPLE TRANSFER UTILITY (C)

M/L For Cassette & Disk Program Transfer

Transfer content of disk to tape * Transfer content of tape to disk * Select or File Open * Will automatically relocate those cassette programs that conflict with the disk operating system * Will display machine language program address * Copies ASCII Basic & Machine language Programs * All contained in 1 menu driven program **

REQUIRES 32K CC EXT.
Cassette \$19.95 Disk \$24.95

SPIT-N-IMAGE (C)

M/L Disk Back-Up Utility

There is no need to suffer the heartbreak of crashed disks any longer. Spit-N-Image will create a mirror image of your valuable disk programs which do not respond to normal back-up functions. Will save minutes and back-up in one pass. Data processing experts always insist on having a back-up - it's good practice - Don't wait!

REQUIRES 32K CC AND 1 OR MORE DRIVES
DISKETTE \$34.95

215-946-7260
COMPUTIZE, INC.

P.O. BOX 267
LAUREL, CO. 80647
ADD \$3.00 S/H



17..... 72
END 29

Listing 2:

```
1 '*****
2 '      JUNKFDD
3 '      CDPR. (C) 1984
4 '      BY DAVID TAYLDR
5 '*****
6 'PART#2 :RUN AND LDAD PART#3
7 '*****
8 FORX=13296TD14255:READ Z:PDKEX
,Z:NEXT
9 DATA112,32,198,108,159,60,106,
166,159,60,106,129,4,39,150,37,7
2,129,7,37,5,79,167,159,60,106,1
66,159,60,110,129,4,39,75,134,9,
16,190,59,233,49,40,174,159,60,6
6,230,132
10 DATA231,164,48,4,49,63,74,46,
245,236,159,60,66,16,163,159,60,
108,39,9,131,0,1,237,159,60,66,3
2,11,236,159,60,108,195,0,3,237,
159,60,66,57,16,190,59,233,49,40
,198
11 DATA128,231,164,49,63,16,188,
59,233,45,237,32,244,134,9,16,19
0,59,233,49,40,198,128,231,164,4
9,63,74,46,247,32,185,190,60,106
,140,60,199,39,7,48,1,191,60,106
,32,6,142
12 DATA60,193,191,60,106,190,60,
110,140,60,206,39,7,48,1,191,60,
110,32,6,142,60,200,191,60,110,1
90,60,108,140,60,219,39,7,48,2,1
91,60,108,32,6,142,60,207,191,60
,108,190
13 DATA60,66,140,60,233,39,7,48,
2,191,60,66,32,6,142,60,221,191,
60,66,57,246,61,85,90,88,79,195,
10,30,31,2,190,61,86,134,10,183,
59,212,236,129,237,164,49,168,32
,122
14 DATA59,212,46,244,57,204,10,0
,253,61,86,246,61,85,193,1,39,9,
189,52,197,204,60,158,253,61,86,
```

```
122,61,85,141,112,246,61,85,39,6
,189,55,152,189,56,32,16,142,12,
94,126
15 DATA50,204,189,59,79,126,57,2
4,134,3,183,59,237,16,142,59,215
,236,161,132,240,129,224,16,39,1
,39,196,240,193,224,16,39,1,31,1
22,59,237,46,233,182,59,238,129,
1,16,39,252
16 DATA217,57,190,61,89,166,132,
129,3,37,14,129,4,38,14,246,61,8
8,193,1,37,7,124,61,88,198,5,231
,132,48,1,140,62,212,39,4,191,61
,89,57,142,62,180,124,61,88,32,2
44
17 DATA16,142,128,128,142,12,254
,16,175,129,140,34,0,38,248,16,1
91,12,158,16,191,12,190,16,191,1
2,222,204,3,33,253,60,104,204,0,
0,253,61,91,127,61,88,142,60,186
,16,142,60
18 DATA193,166,128,167,160,16,14
0,60,200,38,246,142,62,148,16,14
2,62,180,16,191,61,89,236,129,23
7,161,140,62,180,38,247,204,128,
128,253,62,117,253,62,119,253,62
,139,253,62,141,253,62
19 DATA143,253,62,145,183,62,147
,57,252,59,239,16,179,11,163,39,
15,204,0,0,253,61,91,252,11,163,
253,59,239,126,49,40,204,60,28,2
53,59,213,16,190,59,210,189,49,1
64,204,9,192
20 DATA142,59,210,16,163,132,35,
56,131,1,128,31,1,16,131,10,192,
39,54,16,142,61,93,236,164,237,1
32,236,34,237,2,49,36,48,136,32,
16,140,61,121,38,237,48,136,132,
95,134,159
21 DATA167,128,92,193,27,38,249,
189,56,2,189,59,79,126,52,229,19
5,3,64,16,131,36,0,38,186,204,0,
0,253,61,91,126,49,40,142,16,1,1
27,59,209,16,142,61,121,127,59,2
08,236
22 DATA161,195,96,96,237,129,124
,59,208,182,59,208,129,14,38,239
,124,59,209,246,59,209,193,12,38
,16,16,140,62,117,39,17,127,59,2
08,127,59,209,48,4,32,213,49,168
,228,48,4,32
23 DATA203,189,55,243,189,59,79,
126,52,229,204,0,184,253,62,136,
142,59,245,191,59,199,190,59,199
,182,255,35,138,8,183,255,35,230
,128,39,9,247,62,133,189,54,191,
191,59,199,57,52
24 DATA80,206,62,133,142,59,243,
191,59,241,174,67,166,159,59,241
```

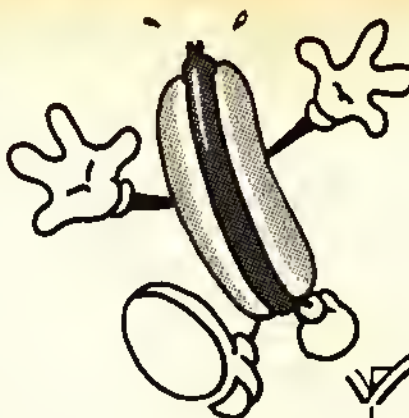

, 39, 73, 198, 255, 61, 132, 252, 186, 25
5, 32, 183, 255, 32, 230, 196, 48, 31, 38
, 12, 16, 190, 59, 241, 49, 33, 16, 191, 5
9, 241, 174, 67, 90

25 DATA38, 237, 126, 54, 245, 126, 54,
248, 126, 54, 251, 18, 198, 3, 244, 255,
32, 247, 255, 32, 230, 196, 48, 31, 38, 1
2, 16, 190, 59, 241, 49, 33, 16, 191, 59,
241, 174, 67, 90, 38, 237, 32, 177, 53, 8
0, 57, 129, 3

26 DATA16, 38, 252, 59, 204, 32, 0, 253
, 62, 136, 142, 60, 17, 191, 59, 199, 134
, 20, 183, 59, 204, 142, 59, 154, 16, 142
, 11, 170, 189, 50, 224, 48, 12, 49, 38, 1
89, 50, 224, 48, 20, 49, 168, 26, 16, 140
, 13, 10, 38

27 DATA235, 189, 54, 166, 142, 59, 160
, 16, 142, 11, 170, 189, 50, 224, 48, 6, 4
9, 38, 189, 50, 224, 48, 26, 49, 168, 26,
16, 140, 13, 10, 38, 235, 189, 54, 166, 1
22, 59, 204, 46, 189, 204, 48, 48, 253, 6
2, 127, 253, 62

28 DATA131, 204, 49, 48, 253, 62, 129,
189, 50, 115, 189, 53, 112, 141, 36, 189
, 56, 132, 189, 56, 132, 126, 51, 95, 142
, 60, 193, 246, 255, 0, 193, 126, 39, 13,
193, 254, 39, 9, 48, 1, 140, 60, 200, 39,
235, 32, 236, 191



17 80
END 29

Listing 3:

```
1 * *****
2 *                               JUNKFOOD
3 *                               COPR. (C) 1984
4 *                               BY DAVID TAYLOR
5 * *****
6 * PART#3 : RUN AND LOAD PART#4
7 * *****
8 FORX=14256T015215:READ Z:POKEX
  ,Z:NEXT
9 DATA60,106,57,142,10,0,16,142,
```

Educational Programs

BASKETBALL STATISTICS

Coaches, let CoCo do the paperwork! Keeps each individual game, plus league, non-league and all game totals for a maximum of 16 players in up to 29 games. Stats can be kept in as many as 17 different categories — assists, steals, field goals, and free throw stats (made-attempted-percentages), offensive and defensive rebounds, turnovers, personal fouls, charges, playing time, quarters played and points. Totals for the opposition team and for your individual players are printable. Your season record and scores to date are available at any time. Also, prints a year end summary of each individual player on a game by game basis. Team stats for your team and the opponents' totals for the year are included. Menu driven • Easy to Run • Excellent for most any basketball team.

32K Disk
\$29.95



Write for a free brochure
or ask for a dealer demonstration. Priced from
\$9.95 to \$31.95. Requires Extended Basic. Avail-
able for both tape and disk.



B-5 Software Co.
1024 Bainbridge Place
Columbus, Ohio 43228
Phone (614) 276-2752

CONGRESS

An award winning political simulation by Jett Stevens. Have you ever wondered what it feels like to be the President of the United States? Congress lets you be the President. You select a program to get through Congress. You decide which states to influence through pork-barrel legislation. You assign lobbyists to the House or Senate, and you determine how to use log

rolling favors. Finally, you decide whether to sign a bill into law or veto it. Your overall performance is rated in comparison to the popularity of other presidents. "Congress" also serves as a fine tutorial on how a bill becomes a law. It will add a spark to any government class. All would-be politicians will enjoy it.

Grades 7-12 and Adult
32K Cass. - \$29.95
32K Disk - \$31.95

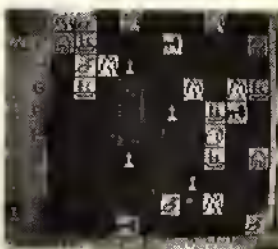


RECESS GAMES

A superb Christmas gift! Four Games in one program provide an enjoyable format for using higher level thinking skills. Players must reason logically while playing Treasure Hunt, Masterbrain, Tic Tac Toe, and Number Guess. Children use co-ordinates and a hot/cold thermometer to find a treasure hidden behind a grid. Number Guess includes an optional use of a number line to help children approximate answers. In Master-

brain, players must consider the many possible ways to arrange specific digits to build numbers. Tic Tac Toe encourages children to predict and plan sequential moves. All games are multi-leveled so children of different ages can play the same game. One and two player options — Large graphic numerals — Attractive Screen Displays.

Grades 2-8
16K Cass.(2) - \$19.95
32K Disk - \$21.95



SPELLING

Add zest to the basics! Spelling allows you to input your own words and save them on data files (tape or disk). You may also purchase ready made data files (below). During the lesson a word flashes on the screen, and the student then types the word. If the word is misspelled, the correct spelling appears and aligns itself under-

neath the misspelling. The student can quickly determine the error and correct it. The score is given continuously, and all misspelled words are given at the end. A graphic display of superlative words and song provide a reward. Printer use is optional. Spelling will accept words with apostrophes, hyphens, and spaces. Word lists may be easily edited.

Grades 2-8
16K Cass. - \$19.95
32K Disk - \$21.95

Data Files
Dolch Words
Most Misspelled
Space Words
Grades 2, 3, 4, 5, or 6
\$8.95 each - Cass.
\$10.95 each - Disk

11, 170, 189, 50, 224, 49, 38, 189, 50, 2
24, 49, 168, 26, 16, 140, 13, 10, 38, 239
, 57, 68, 72, 177, 11, 161, 39, 1, 57, 182
, 61, 85, 129, 7, 38, 1, 57, 124, 61, 85, 1
89

10 DATA52, 197, 182, 59, 205, 139, 2, 1
29, 58, 39, 4, 183, 59, 205, 57, 134, 48,
32, 248, 204, 160, 0, 253, 62, 136, 142,
59, 251, 191, 59, 199, 126, 54, 166, 182
, 255, 35, 138, 8, 183, 255, 35, 204, 2, 8
8, 253, 62, 136

11 DATA142, 59, 253, 230, 128, 39, 8, 2
47, 62, 133, 189, 54, 191, 32, 244, 57, 1
82, 255, 35, 138, 8, 183, 255, 35, 204, 6
4, 0, 253, 62, 136, 198, 63, 247, 62, 133
, 189, 54, 191, 204, 104, 0, 253, 62, 136
, 189, 54, 191, 204

12 DATA64, 0, 253, 62, 136, 198, 67, 24
7, 62, 133, 189, 54, 191, 204, 84, 0, 253
, 62, 136, 198, 75, 247, 62, 133, 189, 54
, 191, 204, 104, 0, 253, 62, 136, 198, 85
, 247, 62, 133, 189, 54, 191, 204, 0, 0, 1
95, 0, 1, 16

13 DATA131, 64, 0, 38, 247, 204, 32, 0,
253, 62, 136, 198, 41, 247, 62, 133, 189
, 54, 191, 57, 134, 32, 183, 59, 203, 190
, 59, 201, 166, 132, 129, 4, 38, 15, 198,
5, 231, 132, 48, 7, 140, 62, 179, 34, 21,
191, 59, 201

14 DATA57, 122, 59, 203, 39, 247, 48, 1
, 140, 62, 180, 38, 223, 142, 62, 148, 32
, 218, 48, 136, 224, 32, 230, 206, 37, 0,
16, 206, 38, 0, 79, 183, 255, 198, 183, 2
55, 200, 183, 255, 203, 183, 255, 204, 1
83, 255, 206, 183, 255

15 DATA208, 183, 255, 210, 183, 255, 1
92, 183, 255, 194, 183, 255, 196, 134, 5
, 180, 255, 34, 138, 8, 183, 255, 34, 16,
142, 175, 175, 142, 8, 0, 16, 175, 129, 1
40, 10, 0, 38, 248, 142, 8, 12, 16, 142, 5
9, 92, 189, 57, 74

16 DATA142, 8, 75, 189, 57, 74, 142, 8,
111, 189, 57, 74, 142, 8, 138, 189, 57, 7
4, 189, 59, 27, 126, 48, 10, 142, 11, 160
, 16, 142, 8, 32, 189, 50, 224, 16, 142, 1
75, 175, 142, 8, 192, 16, 175, 129, 140,
10, 0, 38

17 DATA248, 79, 183, 255, 198, 183, 25
5, 194, 183, 255, 196, 189, 57, 87, 189,
58, 139, 189, 58, 213, 189, 55, 152, 126
, 48, 10, 236, 161, 16, 131, 128, 0, 39, 4
, 237, 129, 32, 244, 57, 142, 8, 32, 16, 1
42, 59, 172, 166, 160

18 DATA161, 128, 34, 9, 37, 51, 16, 140
, 59, 178, 38, 242, 57, 142, 8, 32, 16, 14
2, 59, 178, 166, 160, 161, 128, 34, 9, 37
, 39, 16, 140, 59, 184, 38, 242, 57, 142,
8, 32, 16, 142, 59, 184, 166, 160, 161, 1
28, 34, 8

19 DATA37, 41, 16, 140, 59, 190, 38, 24
2, 57, 189, 57, 205, 189, 58, 45, 189, 58
, 71, 57, 189, 57, 205, 142, 59, 178, 16,
142, 59, 184, 189, 58, 59, 142, 59, 193,
16, 142, 59, 196, 189, 58, 90, 57, 189, 5
7, 205, 16, 142

20 DATA59, 190, 189, 58, 62, 16, 142, 5
9, 199, 189, 58, 98, 57, 142, 8, 233, 16,
142, 59, 132, 189, 57, 74, 16, 142, 9, 46
, 134, 128, 167, 164, 167, 33, 167, 34, 1
34, 77, 167, 164, 173, 159, 160, 10, 204
, 0, 0, 195, 0

21 DATA1, 16, 131, 64, 0, 38, 247, 246,
1, 90, 193, 6, 37, 26, 193, 57, 46, 32, 18
2, 255, 0, 129, 126, 39, 4, 129, 254, 38,
218, 49, 33, 16, 140, 9, 49, 39, 23, 126,
57, 227, 166, 164, 129, 65, 39, 201, 74,
126

22 DATA57, 229, 166, 164, 129, 90, 39,
191, 76, 126, 57, 229, 57, 142, 59, 178,
16, 142, 59, 184, 189, 50, 224, 48, 26, 4
9, 58, 189, 50, 224, 142, 8, 32, 49, 58, 1
89, 50, 224, 57, 142, 59, 193, 16, 142, 5
9, 196, 236, 132

23 DATA237, 164, 166, 2, 167, 34, 48, 2
9, 49, 61, 236, 132, 237, 164, 166, 2, 16
7, 34, 142, 9, 46, 49, 61, 236, 132, 237,
164, 166, 2, 167, 34, 16, 142, 59, 148, 1
89, 57, 74, 142, 8, 233, 16, 142, 59, 148
, 189, 57, 74

24 DATA142, 8, 245, 16, 142, 59, 148, 1
89, 57, 74, 57, 142, 8, 235, 16, 142, 59,
136, 189, 57, 74, 142, 9, 41, 134, 49, 16
7, 132, 76, 167, 136, 64, 76, 167, 137, 0
, 128, 16, 142, 59, 190, 48, 3, 236, 161,
237, 129, 166

25 DATA160, 167, 132, 48, 136, 62, 16,
140, 59, 199, 38, 239, 142, 59, 172, 16,
142, 9, 49, 189, 50, 224, 48, 6, 49, 168,
64, 189, 50, 224, 48, 6, 49, 168, 64, 189
, 50, 224, 57, 142, 8, 192, 204, 246, 246
, 189, 58, 245

26 DATA142, 8, 192, 204, 249, 249, 189
, 58, 245, 246, 255, 0, 193, 126, 39, 4, 1
93, 254, 38, 227, 57, 237, 132, 237, 137
, 1, 32, 48, 2, 140, 8, 224, 38, 243, 48, 3
1, 237, 132, 48, 136, 32, 140, 9, 255, 38
, 246, 204, 0

27 DATA0, 195, 0, 1, 16, 131, 48, 0, 38,
247, 57, 16, 190, 60, 106, 190, 61, 51, 4
8, 1, 140, 62, 212, 39, 25, 49, 33, 16, 14
0, 60, 200, 38, 4, 16, 142, 60, 193, 246,
255, 0, 193, 126, 39, 11, 193, 254, 39, 7

28 DATA32, 224, 142, 62, 180, 32, 238,
191, 61, 51, 16, 191, 60, 106, 57, 204, 0
, 0, 195, 0, 1, 16, 131, 255, 255, 38, 247
, 57, 10, 21, 14, 11, 6, 15, 15, 4, 128, 0,
67, 79, 80, 82, 110, 96, 113, 121, 120, 1
16

HARDWARE & PROGRAMS

MONITORS

BMC MEDIUM-RES COLOR

13" BMC w/ sound \$303.95
 14" UST w/ sound \$324.95
 12" Taxon Composite & RGB... \$335.95

COMREX HI-RES MONOCHROME

12" Amber or Green..... \$140.95
 9" Amber or Green..... \$125.95

Sorry, no C.O.D. on monitors.

COMPOSITE MONITOR INTERFACES

Double Driver..... \$24.95
 Video Plus..... \$24.95
 Both work great with color or monochrome on CoCo 1.

Coco Double Driver..... \$28.95
 Video Plus II M..... \$26.95
 Video Plus II C..... \$39.95
 For CoCo II Only

JARB DISK DOUBLER

Why spend twice as much as you need to for double sided diskettes? With our doubler, you can make your own and pay for it with the first box you double. A must for disk drive users.

5 1/4" size only \$12.95

BASF DATA CASSETTES

	C-05	C-10
1-10	.60 ea.	.65 ea.
11-20	.55 ea.	.60 ea.

Soft Poly Cases..... Ea. \$2.10
 Hard Shelled Cases..... Ea. \$2.22
 Cassette Labels (12)..... Sh. \$3.36
 Cassette Labels Tractor (1000).... \$21.95

MEMORY UPGRADE KITS

16K RAM CHIPS 1.50 ea.
 5V, CoCo II 16K 1.95 ea.

*64K RAM CHIPS

Eight 200 NS Factory Prime 64K RAM Chips. Allows you to upgrade 'all' board easily. No soldering needed. \$52.50

*16K/32K

Eight 200 NS Factory Prime Chips with Piggy Backed Sockets, Sam Socket, Bus Wire, Comprehensive Instructions. Recommended for "D" or earlier, but may be used on "E". Only 9 simple solder connections to kit. None to computer. \$25.95
NOT FOR CoCo 2

NEW



©JARB SOFTWARE 1984

THE GUNFIGHTER

By Terry A. Sven

An excellent hi-res, arcade quality game program for two players. Joysticks and 32K are required in this all machine language program.
 Cassette . \$19.95 Disk/Am disk . \$24.95

JUNGLE TREK

Lost in a jungle with wild animals lurking; your only survival is to find a safe compound before you are lunch for lions; high resolution; multi-color.
 16K EXT \$14.95

BIORHYTHM/PSYCHIC APT.

1) Prints biorhythm charts of nearly unlimited length; attractively formatted for use on most printers. 16K
 2) Your psychic ability is determined through questions evaluating your psychic experiences
 16K Ext Both for \$15.95

PROGRAMS FOR THE SPECTRUM PROJECTS VOICE-PAK

OR SPEECH SYSTEMS VOICE

TALKING FINAL COUNTDOWN

(by Bill Cook)

For 32K EXT \$19.95
 Standard cassette
 FINAL COUNTDOWN..... \$14.95

TALKING SPELL-A-TRON

The program allows the user to build a dictionary of words. During testing, the words are spoken. If an incorrect response is given, the word is spoken again and spelled. Tape (32K EXT) \$22.95

TALKING SCORE E-Z

A yuhtzee type program. Up to six players can compete. All scoring and record keeping is done by the computer. Tape (32K EXT)..... \$19.95
 Standard SCORE E-Z \$15.95

TALKING COLOR MATH

The perfect educational game to aid the student in learning addition, subtraction, multiplication and division. Allows one to specify difficulty level.
 Tape (32K EXT) \$22.95

TALKING SHIP HUNT

by Cobra Software

Play Battleship against your computer. 32K w/ joystick needed. Graphics and sound. Can be played without voice.
 Cassette \$10.95

SCHEMATIC DRAFTING PROCESSOR (disk) can draw large scale schematics in hi-res (has six overlapping screens) and then print them out to any of several popular printers, fast!! A must for serious hardware computerist.
 Now only..... \$49.95

CoCo Chips

Sam, Pia, CPU, Ext, Basic

We carry products from many manufacturers. If you don't see it, ask.

JARB

1636 D Avenue, Suite C
 National City, CA 92050

SOFTWARE
 HARDWARE

COD orders accepted, no charge cards please.
 Shipping and handling \$3.00
 California residents please add 6% sales tax

Order Line (619) 474-8982
 After Hours BBS (619) 474-8981

PRO-COLOR-SERIES

©1984 BY DERRINGER SOFTWARE, INC.

NOBODY, BUT NOBODY HAS DONE IT LONGER AND BETTER THAN US!

A fully integrated series of programs that offers a full range of information tracking capability.

PRO-COLOR-FILE *Enhanced*

\$79.95

This is the main link in the series. With PRO-COLOR-FILE, you can design a full featured database that is custom tailored to your needs. Its ability to allow the user to custom define formats is unmatched by anything else on the market. A full range of features for information handling is available for any application you might have:

- 60 Data Fields for storing data
- 1020 bytes capacity per record
- Variable record length capability
- Multi-drive drive ability
- Allows maximum system storage
- 4 Custom designed screen formats
- 28 Equation lines (+ - * /)
- 8 Custom designed report formats
- Send reports to printer or screen
- Summarize file by groups of records
- Column totals and averages
- Posting routine performs file wide calculations and updates fields
- 6 Custom designed mailing label formats
- Custom designed menus for selection of reports and label formats
- Selectable password protection for data entry screens and reports
- Sort any size file
- 3 level sort capability
- Select options for sorting or reporting sub-sets of a file
- Duplicate records and fields
- Cursor controlled text editing
- Fast record selection via indexing
- Global file searching

As a database is created, all of the formats are stored in a file which means you won't have to enter if each time you want to print a report or label. Once your database is up and running, you can install a limited menu that will lead even the most timid user through the program. Since menu selection of report formats are custom made, you'll know exactly which format does what.

PRO-COLOR-FILE is also supported by a NATIONAL USERS' group. Their quarterly newsletter is packed with ideas for using PRO-COLOR-FILE to its fullest. A listing of database programs that have already been created is also provided for comparing notes with other users. Useful database information such as magazine articles are available on a data disk for use on your own system.

Think about it, how can a program exist for over a year and a half, be sold in every state and overseas, and have the support of a national users' group? Simple, it's that good!

PRO-COLOR-FORMS**

\$39.95

This is the second link in the series. PRO-COLOR-FORMS offers the ability to merge data files with text files. Just imagine being able to place the data you enter with PRO-COLOR-FILE anywhere on a sheet of paper, either by itself or within an external source of text. Then you'll have the picture. This means you could write a general letter to a list of people but have each one custom printed with their name and address. You can pre-enter checks into a data base and then have the checks printed on form-teeed checks. You might even use form-feed statements for sending out to customers at the end of each month. All of the parameters can be modified to indicate just what size "page" you need for any application:

- 6 Menu Selectable formats
- Page width from 40 to 133 characters
- Lines per page from 7 to 66
- Supports printer control codes
- Converts any ASCII file for use
- Prints multiple copies
- Interfaces with PRO-COLOR-FILE
- Password protection

If you need to generate forms from your data files then chances are you can do just that with PRO-COLOR-FORMS. Form letters, billing statements, index cards, or even post cards can be used easily.

PRO-COLOR-DIR**

\$24.95

The latest addition to the series is a utility for organizing disk directories into one nice listing. PRO-COLOR-DIR reads the directory of a diskette and then stores valuable information about each program into a master data file. This data file can then be accessed by PRO-COLOR-FILE for sorting, searching and reporting. PRO-COLOR-DIR will create a record for each filename on a diskette and store the following information about each one:

- Diskette ID name
- Date diskette was created
- Last date diskette was updated
- Filename and extension
- File type (BASIC, ML, Text, Data)
- Number of Gans allocated
- Number of sectors allocated and used
- Machine Language program addresses

PRO-COLOR-DIR allows for hardcopies of a single diskette's files and has a versatile label printing routine. A global replace function can re-store a diskette's files with deleted files being removed or new ones appended automatically.

PRO-COLOR-FORMS & PRO-COLOR-DIR Require PRO-COLOR-FILE to be used

Requires 32K Disk Basic

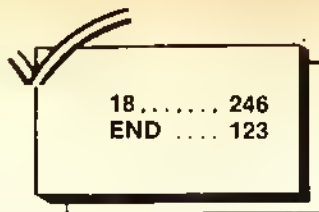
ANNIVERSARY SPECIAL

Take advantage of this special offer NOW to get the best database series on the market at a super price!

	SALE	
PRO-COLOR-FILE *Enhanced*	\$59.95 Save \$20	Checks
PRO-COLOR-FORMS	\$29.95 Save \$10	Money Order
PRO-COLOR-DIR	\$19.95 Save \$5	Visa
ALL THREE	\$99.95 Save \$44	Master Card
		COD
		Add \$3.00 for
		Shipping & Handling

Derringer Software Inc., P.O. Box 5300, Florence, S.C. 29502 -- (803) 665-5676 9 a.m. - 5 p.m.

Note: All of our programs have registration cards - If you've purchased one from another dealer, then you should be registered with us. If not, send your name, program ID# and where the program was purchased. We want to keep you informed about changes.



Listing 4:

```
1 *****
2 JUNKFDDD
3 CDPR. (C) 1984
4 BY DAVID TAYLDR
5 *****
6 PART#4 : RUN AND EXEC12288
7 *****
8 DR, BEFORE EXEC'ING : CSAVEM
  "JUNKFDDD", 12288, 15988, 12288
9 *****
10 FDRX=15216T015989:READ Z:PDKE
  X, Z:NEXT
11 DATA128,0,66,89,128,0,68,65,8
  6,73,68,96,84,65,89,76,79,82,128
  ,0,14,5,23,32,8,9,7,8,32,19,3,15
  ,18,5,128,0,175,175,175,175,128,
  0,66,79,78,85,83,32
12 DATA2,15,14,21,19,32,58,32,49
  ,48,48,48,48,48,48,48,48,48,48,4
  8,48,48,48,48,48,48,48,48,48,48,
  32,32,32,32,32,32,32,32,0,0,0
  ,0,0,0,0,0,0
13 DATA0,0,0,0,0,0,0,0,128,128,128
  ,128,128,128,0,0,0,0,0,0,0,0,0,0
  ,0,0,0,0,0,0,0,0,0,0,0,0,255,0,4
  2,31,42,28,38,0,255,0,64,58,64
14 DATA58,52,58,52,46,52,46,40,4
  6,40,34,40,34,28,34,28,0,64,58,6
  4,58,64,58,64,58,64,58,0,128,128
  ,128,128,186,128,191,128,202,186
  ,202,186,128,186,128,186,128,186
  ,128,186
15 DATA128,186,128,186,128,186,1
  81,128,181,128,202,128,186,128,1
  28,128,128,128,0,0,144,149,154,1
  44,144,159,159,144,149,159,159,1
  54,159,159,159,159,181,191,191,1
  86,191,191,191,191,181,191,191,1
  86
16 DATA159,159,159,159,159,159,1
  59,159,3,32,0,0,0,0,0,0,128,128,
  128,128,128,128,128,128,128,138,
  128,138,133,138,128,143,143,133,
  133,133,133,138,143,138,128,133,
  143,128,128,128,128,128
17 DATA128,128,128,128,128,128,1
  28,128,128,128,128,128,128,128,1
  86,128,191,128,202,186,202,186,1
  28,186,128,186,128,186,128,186,2
  02,186,191,128,128,128,128,128,1
```

```
28,128,128,128,2,1,2,1,0,3
18 DATA3,38,182,9,9,66,78,69,1,0
  ,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
  ,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
  ,0,224,224,224,224,224
19 DATA224,224,224,224,234,224,2
  34,229,234,224,239,239,229,229,2
  29,229,234,239,234,224,229,239,2
  24,224,224,224,224,224,224,224,2
  24,176,176,176,176,176,176,176,1
  76,176,154,149,176,181,159,159,1
  86,191
20 DATA159,159,191,181,159,159,1
  86,176,159,159,176,176,149,154,1
  76,176,176,176,176,0,0,4,2,5,4,5
  ,1,4,2,4,3,5,2,5,1,4,2,1,1,5,4,2
  ,5,1,5,4,1,1
21 DATA4,3,4,2,2,0,0,0,2,0,0,0,0
  ,245,255,250,128,255,255,255,240
  ,255,175,255,255,255,175,255,255
  ,255,175,255,255,255,255,255,240
  ,245,255,250,128,129,131,131,131
  ,131,130,128
22 DATA129,130,128,128,128,129,1
  30,129,131,131,131,131,130,128,1
  29,131,131,131,131,130,128,133,1
  42,140,140,140,143,130,133,138,1
  28,128,128,133,138,133,142,140,1
  40,140,143,130,133,142,140,140,1
  40,143
23 DATA130,133,138,128,128,128,1
  33,138,133,138,128,128,128,133,1
  38,133,138,128,128,128,133,138,1
  33,138,128,128,128,133,138,133,1
  38,128,128,128,135,136,133,138,1
  28,128,128,133,138,133,138,128,1
  28,128
24 DATA135,136,133,138,128,128,1
  28,135,136,133,143,143,143,143,1
  38,128,133,138,128,128,128,133,1
  38,133,143,143,143,143,136,128,1
  33,143,143,143,143,136,128,133,1
  38,128,128,128,141,130,133,138,1
  28,128
25 DATA128,133,138,133,138,128,1
  28,133,138,128,133,138,128,128,1
  28,128,128,133,138,128,128,128,1
  33,138,133,138,128,128,128,133,1
  38,133,138,128,128,128,143,128,1
  33,138,128,128,128,128,128,133,1
  39,131
26 DATA131,131,143,136,128,141,1
  31,131,131,142,128,133,138,128,1
  28,128,133,138,133,138,128,128,1
  28,128,128,132,140,140,140,140,1
  36,128,128,128,140,140,140,128,1
  28,132,136,128,128,128,132,136,1
  32,136
27 DATA128,128,128,128,128
```

This is the first in a three-part series on diskette file organization

The Diskette Directories Handler System

By Marvin E. Swan

As your disk system grows, it becomes impossible to keep control of every program and file. Why not let your CoCo keep track of this information for you? Let it look at its own programs and files, gather its own information about itself then report to you what it has found.

The *Diskette Directories Handler* is the answer to an easy and efficient way to organize diskette files for your CoCo. The *Handler* system consists of three integrated BASIC programs that generate all your diskette directories information into seven comprehensive reports, plus one quick documentation print-out

(Marvin E. Swan is an employee of Pac-car, Inc., manufacturers of Kenworth trucks, Peterbilt trucks and railroad cars. He is a data processing systems analyst at a centralized computer facility with experience on IBM mainframes and minis. He and his wife, Lajranna, have two sons in college.)

program. The *Handler* system requires 32K, Extended Disk BASIC, a disk drive, cassette tape recorder and printer. Each presented screen is "mapped out" in an attractive format rather than the conventional screen scroller.

The *Handler* system creates diskette gum labels and jacket labels for every diskette in your library, as well as creates a master catalog of all your diskettes. It extracts directory information and produces a load report, diskette names and usage report, and a directory consolidation report so you can find what you want in seconds. You will see at a glance, all your machine language RAM addresses, multiple cataloged programs/data files and it lets you know of any programs with the same name that are of a different byte size. The *Handler* system shows how many bytes are still available on each diskette and which diskette has the most space.

The *Handler* system is genuinely self-prompting and user friendly. Here is a

HARD DISK for the CO CO

5 meg \$1295

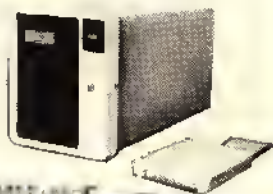
10 meg \$1595

----- COMPLETE SYSTEM ----- JUST PLUG IN -----

HARD DISK - OPERATING SYSTEM features

- FULLY INTEGRATED INTO COLOR DISK BASIC
- TAPE TO HARD DISK
- DISK TO HARD DISK
- HARD DISK TO TAPE
- HARD DISK TO DISK
- DUPLICATE
- COLD START
- M-RUN

• ALL EXTENDED-DISK-BASIC COMMANDS



without hard drive ... operating system only
INTERFACE CARD & H-DOS \$425.00

PERIPHERAL H-DOS UTILITY PACK \$129.00
BOOT STRAPS OS-9 OR FLEX, MDIR (master directory)

DISK DRIVES CoCo

for the

TANDDN DISK DRIVES

40 track - 6 ms trk-trk
FULLY COMPATIBLE

TEAC DISK DRIVES

FD-55 Series

- Models of 5-1/4" floppy disk drives
- 1/2 the height of conventional drives
- Choice of capacity from 125 Kbytes to 1.6 Mbytes
- New TEAC LSIs reduce power consumption, increase reliability
- Brushless DC direct drive motor
- High speed data access



Super Sale on New Disk Drives

Distributor for - SOFTWARE SUPPORT, INC., Framingham, MA.

128 K - RAM CARD

INCREASE YOUR 64 K Co-Co OR Co-Co II TO 128 K RAM

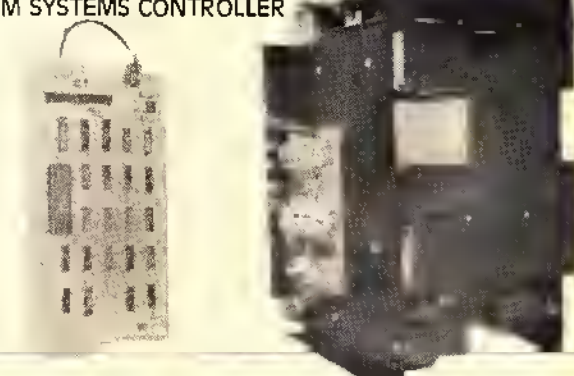
- ☐ FITS COMPLETELY INSIDE YOUR COMPUTER.
- ☐ SWITCHES TWO NEW 32 K BANKS OF RAM IN AND OUT OF MEMORY.
- ☐ BANKS CAN BE MAPPED IN THE UPPER HALF OR LOWER HALF, OR CAN ALSO BE A SECOND COMPLETE 64 K BANK.
- ☐ SWITCH TABLES INCLUDED.
- ☐ SIMPLE INSTALLATION AND DOCUMENTATION.
- ☐ A MUST FOR OS-9 USERS.
- ☐ COMPLETE WITH 8 (4164) RAM CHIPS.
- ☐ PAL CHIP HANDLES ALL BANKING COMMANDS.

\$149.95



MODEL III & 4 DISK CONTROLLER KIT

- ☐ AVAILABLE FOR FULL HEIGHT OR SLIM LINE DRIVES
- ☐ EASY INSTALLATION
- ☐ FULLY TESTED AND ASSEMBLED
- ☐ COMPLETE WITH EASY INSTRUCTIONS
- ☐ J & M SYSTEMS CONTROLLER



USA

RGS MICRO INC.
MAIN STREET
OERBY LINE, VERMONT
ZIP 05830
TEL: 802-873-3386
ORDER LINE 800-361-4970

RGS MICRO INC.

CANADA

RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTRÉAL H2Y 2J3
TEL: (514) 287-1563
ORDER LINE ONLY ***
800-361-5338
WESTERN CANADA 800-361-5155

TERMS: VISA - MASTER CARD - AMERICAN EXPRESS

HOURS: MONDAY - SATURDAY 10:00 AM - 6:00 PM

REAL TIME CLOCK

RTC-10

Full featured, yet very easy to use, RTC-10 is a quartz-based, Time/Date clock contained in a compact ROM case. RTC-10 makes it simple to access the time and date with just a few Basic PEEKS. A 2-year + replaceable battery (included) keeps time accurate when the computer is off and even when the cartridge is unplugged.



ONLY \$89.00

Compatible with any 16K or greater, Extended or non-extended Color Computer, RTC-10 may be used with or without a Radio Shack or any other Multi-Slot unit. To use it with a disk, without a Multi-Slot, order the Y-cable below.

Completely assembled, tested and ready to plug-in and use, with programs included for clock setting and for continuously displaying the Time/Date in the upper right corner of the video screen. ONLY..... \$89.00

COCO CABLES

Top quality cable and connectors with all gold plated contacts.....

Y-CABLE 40 conductor, 1 ft. long, 1 Male, 2 Females. Allows you to connect your disk controller pack and the RTC-10 Clock or most voice synthesizers, etc. ONLY..... \$29.95

DISK PACK EXTENDER CABLE 40 Conductor, 2 ft. long, 1 Male, 1 Female. Lets you place your disk controller pack where you want it, out of your way. ONLY..... \$22.95

CUSTOM FLAT CABLES Call-in or send us your requirement. We will quote a reasonable price for the cable you need.

Custom Computer Products
6 Dogwood Court
Goshen, NY 10924
(914) 469-9780

ccp

ADD \$3.00 PER ORDER FOR SHIPPING & HANDLING
FOR C.O.D. INCLUDE AN ADDITIONAL \$3.00
NY RESIDENTS MUST INCLUDE SALES TAX.

cross reference of all programs and reports and their *RUN* sequence:

you to see which diskette contains the most available space.

PROG. NAME	OPTIONAL REPORT?	REPORT TITLE	SEQUENCED BY
DIR0	no	DOCUMENTATION	
DIR1	yes	#1 EXTR. & LOAD DIR.	your own diskette filing
DIR1	yes	#2 DISKETTE NAMES	diskette name
DIR1	yes	#3 DISKETTE USAGE	number of bytes used
DIR1	yes	#4 DISK JACKET LABELS	your own diskette filing
DIR2	yes	#5 DISK LABELS (gum)	your own diskette filing
DIR3	no	#6 CONSOLIDATION	prog/size/diskette name
DIR3	no	#7 SUMMARY (stats)	

Extract And Load Directories, Report #1

This report is generated by program *DIR1*. The purpose of report #1 is to show detailed catalog information about each diskette in your system. The report is in sequence by your own filing system, in other words, in order by which you insert them into your disk drive. Programs and files are listed as they are encountered in the directory. Report numbers one through four are generated by program *DIR1*. Each printed diskette shows:

- Diskette name
- Programs, files, extension, type and format
- First granule, first track and first sector
- Last granule, last track, and last sector
- Number of sectors/bytes on last track/sector
- Total granules used/available for diskette
- Total bytes used/available for diskette

Diskette Names, Report #2

The purpose of this report is to show general diskette information. No programs or data files are shown. The report is in sequence by diskette name. Each printed line shows:

- Diskette name
- Total number of programs and data files
- Total number of bytes/granules in use and available
- Statistical total line

Diskette Usage, Report #3

This report shows diskette usage of all your diskettes. This report is exactly like Diskette Names except it is in sequence by number of available granules and bytes per diskette, which allows

Diskette Jacket Labels, Report #4

Report #4 gives you the ability to see each diskette directory as you manually flip through your diskette file box. The report prints three directories per page with dotted lines available for cutting, and placing each directory in front of or inserting into each diskette jacket.

Diskette Gum Labels, Report #5

This report is generated by program *DIR2*. This report prints diskette names onto gum labels for attachment to your diskettes for easy identification. Two sizes are available: $3\frac{1}{2} \times 1\frac{15}{16}$ inches and $4 \times 1\frac{15}{16}$ inches.

Consolidated Directories, Report #6

This report is generated by program *DIR3*. Report #6 shows all programs and data files cataloged to your system, sequenced by name, extension, format, type, granule size, byte size and diskette name. You can look up a particular program/data file name, see where it resides and how many multiple versions you may have saved to more than one diskette. An asterisk appears under the "flag" column when you have different byte-sized BASIC or machine language programs of the same name, allowing you to determine the correct version to *RUN* or *EXECUTE*. This report is the nucleus of the *Handler* system, which you will reference more often than others. You can cross reference all programs/data files in your CoCo, giving you the ability to purge and manage your entire diskette library.

Disks Directory Summary, Report #7

Generated by program *DIR3*, report #7 shows statistical and percentage totals of all your diskettes, granules, bytes, programs and data files in your system. The following statistics and percentages will print:

Total diskettes

16 K DOS CARD

- ☐ PLUGS INTO YOUR J-M DISK CONTROLLER AND ALLOWS YOU TO MAP ON AN EXTRA 8 K E-PROM ABOVE OOS.
- ☐ USE YOUR OWN 24 PIN, 8 K OOS AND ONE 2764 E-PROM OR TWO 2764 E-PROMS.
- ☐ GREAT FOR UTILITIES OR A MACHINE LANGUAGE MONITOR.
- ☐ ON BOARD DECODING, ONLY ONE WIRE TO SOLDER. COMPLETE WITH INSTRUCTIONS.



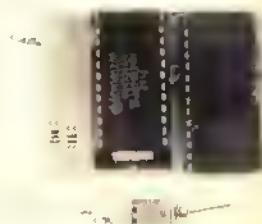
\$19.95

RGS DUAL DOS CARD

WITH SWITCH SELECTOR

DESIGNED TO ACCOMMODATE TWO DIFFERENT OOS CHIPS INSIDE YOUR J-M DISK CONTROLLER.

- ☐ PIN TO PIN COMPATIBLE WITH RS-DOS AND J-DOS CHIPS.
- ☐ THE SWITCH ALLOWS YOU TO HARD SELECT ANY ONE OF THE TWO DOS SYSTEMS OF YOUR CHOICE.
- ☐ IN CENTER POSITION, THE SWITCH DISCONNECTS FROM THE OOS AND BRINGS YOU BACK TO BASIC.
- ☐ DESIGNED FOR ONE 24 PIN ROM AND A 28 PIN E-PROM OR TWO 28 PIN E-PROM CONFIGURATION.
- ☐ EASILY MODIFIED BY CUTTING TWO TRACES ON THE BACK OF THE BOARD.



\$19.95

(Board with switch only)

VIDEO PAL

- ☐ AUDIO-VIDEO INTERFACE
- ☐ MONOCHROME COMPOSITE OUTPUT
- ☐ EASY TO INSTALL, FITS UNDER YOUR KEYBOARD
- ☐ NO SOLDERING!
- ☐ BUILT-IN SPEAKER
- ☐ DOES NOT DISABLE YOUR REGULAR T.V. OUTPUT
- ☐ FULLY TESTED AND ASSEMBLED
- ☐ COMPLETE WITH INSTRUCTIONS.

ALSO AVAILABLE FOR COLOR MONITORS



\$29.95

PROJECT BOARD

A MUST FOR EXPERIMENTS

- ☐ UNLIMITED CHIP POSITIONS
- ☐ GOLD PLATED EDGE CARD CONNECTOR
- ☐ FITS INTO ANY RS DISK PACK
- ☐ HOLES PLATED THROUGH BOTH SIDES
- ☐ EASY TO WIRE - WRAP

GREAT TO BUILD YOUR "TURN OF THE SCREW" PROJECTS.



\$19.95
(TWO FOR \$34.95)

USA

RGS MICRO INC.
MAIN STREET
DERBY LINE, VERMONT
ZIP 05830
TEL: 802-873-3386
ORDER LINE 800-361-4970

RGS MICRO INC.

CANADA

RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTREAL H2Y 2J3
TEL: (514) 287-1563
ORDER LINE ONLY ***
QUEBEC - ONTARIO - MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

TERMS: VISA - MASTER CARD - AMERICAN EXPRESS

HOURS: MONDAY - SATURDAY 10:00 AM - 6:00 PM

Bytes/granules used, not used, final total

* (Note that percentage between granules and bytes do not match because granules are in increments of 2,304 bytes each and bytes are absolute.)

Total BASIC, assembly and machine language programs

Total data files

Total multiple program versions with different byte size

Total diskettes with disk read errors encountered

Total reports you requested from Handler system

Program DIR1

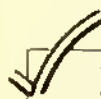
The purpose of DIR1 is to extract diskette directory information from all your diskettes and load to a catalog file, and print numbers one through four. DIR1 asks you to insert all your diskettes into drive 0, one at a time, and asks for a descriptive name of each diskette. All information is placed on cassette

tape to free up the disk drive. When you run out of diskettes, DIR1 transfers the catalog file from tape to the Handler diskette. If you encounter a disk read error on one of your diskettes, the screen instructs you to type GOTO5000 and press ENTER. This will keep you from having to start all over again. Do not insert OS-9 or any foreign diskettes or you will get an FC or BS Error due to incompatible directory format. However, don't worry, just GOTO5000. Disk read errors, FC and BS Errors will be noted on all reports as a disk read error but will produce slightly inaccurate statistical information. When an error like this occurs, all statistical accumulators are zeroed out for that particular diskette and any directory information already extracted for that diskette has already been written out to the catalog file on cassette tape. Therefore, final totals will not exactly match the number of programs and files printed. This is a very slight discrepancy

and is not a problem. When DIR1 is complete, it will automatically RUN DIR2 or DIR3, based on what reports you originally requested. I recommend compressing DIR1 to help it run more efficiently. The following BASIC line numbers contain Epson printer codes that you may change to satisfy your printer requirements: 0820, 0830, 2680 and 3790.

A Continuing Saga

Next month, Part 2 will explain program DIR2, which generates Diskette Gum Labels, Report #5. The following month we will present Part 3 and the final program DIR3, which generates Consolidated Directories, Report #6 (the most important and useful of all seven reports), and Disks Directory Summary, Report #7. Also included will be program DIR0, which prints a quick explanation of the Handler system for when you can't find your RAINBOW for reference.



180..... 68	2370 98
320..... 218	2560 161
510..... 38	2740 44
600..... 179	2930 61
710..... 247	3090 211
860..... 47	3310 180
1060 49	3420 252
1280 209	3600 44
1460 231	3800 130
1690 228	4020 105
1920 60	4250 23
2130 171	END 118

The listing:

```
10 CLS:PRINT
20 VERIFYDN:P=1
30 XP=INT((256*PEEK(25)+PEEK(26)
-256*PEEK(188))/1536)
40 IF P=XP THEN 70 ELSE IF P<XP
THEN 5100 ELSE PCLEAR P:GOTD70
50 '
60 '
70 '[DIR1]
80 'DISKETTE DIRECTORIES HANDLER
90 'PROGRAM 1 DF 3
100 'COPYRIGHT 1984 BY MARV SWAN
110 '
120 'H D U S E K E E P I N G
130 '
140 D1$=CHR$(77)+CHR$(65)+CHR$(8
2)+CHR$(86)+CHR$(39)+CHR$(83)+CH
R$(32)+CHR$(67)+CHR$(79)+CHR$(77
```

```
) +CHR$(80)+CHR$(85)+CHR$(84)+CHR
$(69)+CHR$(82)+CHR$(32)+CHR$(82)
+CHR$(79)+CHR$(79)+CHR$(77):D2=7
0:D4=50
150 D2$=CHR$(80)+CHR$(82)+CHR$(6
9)+CHR$(83)+CHR$(69)+CHR$(78)+CH
R$(84)+CHR$(83):D3=140
160 CLS:PRINT@D2,D1$:PRINT@D3,D2
$:X=X+1:IFX<D4 GOTD160
170 IFX=0 THEN NEWEL9ECLS: CLEAR500
0
180 R6$="X":I$=CHR$(128):E2$="er
ror"+I$+STRING$(8,CHR$(126))+I$+
"no"+I$+"commas"+I$+"allowed":E1
$="error"+I$+STRING$(2,CHR$(126)
)+I$+"must"+I$+"be"+I$+"one"+CHR
$(124)+"twenty"+I$+"char"
190 E0$="are"+I$+"you"+I$+"sure"
+I$+STRING$(19,CHR$(127)):E4$="t
ype"+I$+"n"+I$+"for"+I$+"no"+I$+
"or"+I$+"enter"+I$+"for"+I$+"yes
"+I$+CHR$(127)
200 DIM GR(68) 'GRANS
210 DIM DN$(125):DIM FU(125):DIM
BU(125):DIM BA(125):DIM BU(125)
:DIM GA(125):DIM FE(125) 'DISKE
TTE TABLE
220 FT$(0)="B":FT$(1)="D" 'FILE
TYPE
230 FT$(2)="M":FT$(3)="A"
240 DIM TFT(3) 'FILE TYPE TDTAL
S
250 '
260 GDSUB4340:PRINT@128," turn Y
```


1983 unit sales	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average	Best	Worst
Bach	136	139	119	161	130	104	84	121	95	115	75	161	1440	86	161	75
Chalone	120	170	152	170	182	102	89	157	162	129	64	158			182	64
Dolan	188	157	103	112	161	122	99	145	145	103					188	97
Feagan	105	94	127	115	157	97	61	132	113						174	61
Graham	135	135	183	116	151	104	86	149							183	63
Harpel	134	102	190	161	180	85										
Jordan	105	109	188	171	120											
Latour	112	128	124	129												
Lucido	158	110														
Phelps	167															
Prats																
Schaeferle																
Taylor																
Torres																
Turner																
Wehlen																

DYNACALC
FOR **COCO DOS**
NO OTHER OPERATING SYSTEM NEEDED!

2312 2166 2387 2321 2401 1699 1439 2276 2242 2011 1318 2631 25203 2100

THE BEST OF BOTH WORLDS!

available from



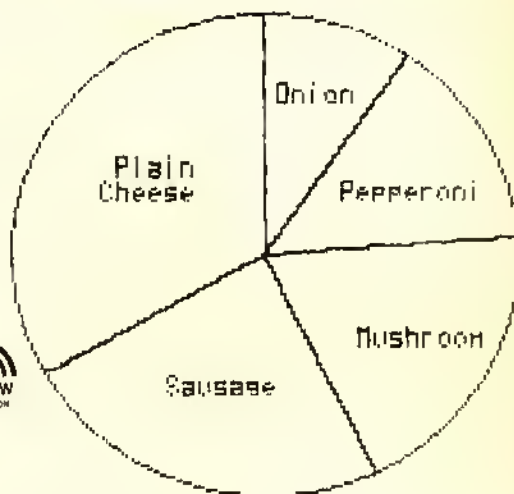
COMPUTER SYSTEMS CENTER
13461 Olive Blvd.
Chesterfield, MO 63017 USA
(314) 576-5020

CSC

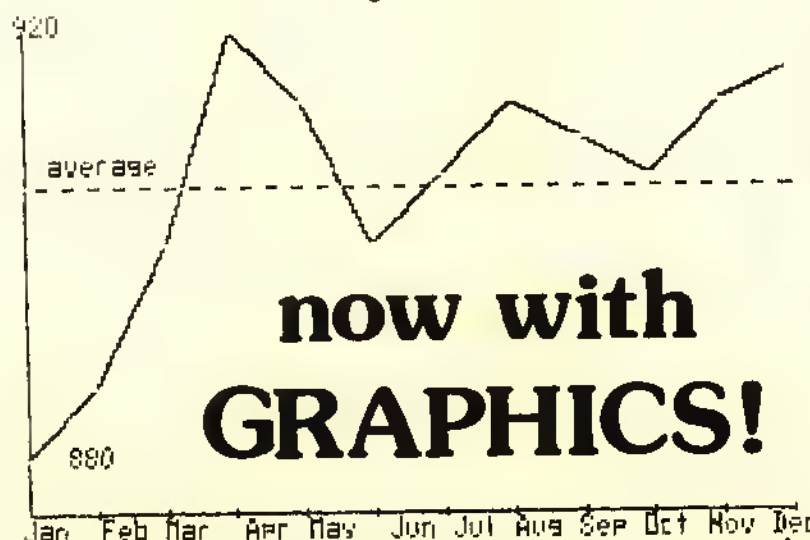
or your local DYNACALC dealer

NOW ONLY \$99.95

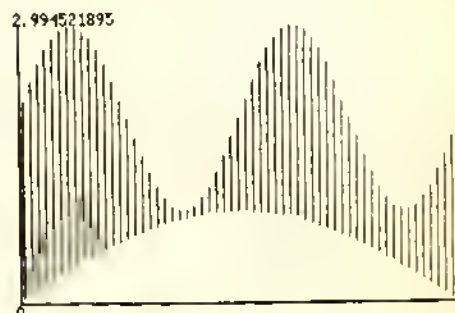
Price ~~\$150~~ postpaid in US & Canada.
Outside North America add \$10 postage.



DYNACALC Reg. U. S. Pat. Off.



**now with
GRAPHICS!**



CANADA
RCS MICRO INC.
759, VICTORIA SQUARE 405
MONTRÉAL H2Y 2J3
TEL: (514) 287-1563
ORDER LINE ONLY ***
QUÉBEC - ONTARIO - MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

```

DUR VDLUME UP":FDRX=1TD70:SDUND1
0,1:NEXTX
270 '
280 GDSUB4340:SDUND10,3:PRINT@14
7," .....":PRINT@120,"":INPU
T" type CURRENT DATE":DATE$
290 IFLEN(DATE$)<5 DR LEN(DATE$)
>8 GDTD280
300 '
310 GDSUB4340:SDUND10,3:PRINT@12
0," type DESIRED WDRK FILE NAME
1-8 CHARACTERS/NO EXTENSION"
320 PRINT" .....":PRINT@193
,"":INPUTFI$
330 IFLEN(FI$)<1 DR LEN(FI$)>8 G
DTD310
340 I=INSTR(FI$,"/"):IFI<>0 GDTD
310
350 I=INSTR(FI$,"."):IFI<>0 GDTD
310
360 FDRX=3TD11
370 DSK1$DR,17,X,A$,B$
380 F=INSTR(B$,FI$)
390 IFF>0THENFT=FT+1
400 F=INSTR(A$,FI$)
410 IFF>0THENFT=FT+1
420 NEXT
430 IFFT<>0THENFT=0:SDUND10,3:GD
SUB4340:PRINT@120," ":FI$:"" FD
UND DN DISKETTE":PRINT" press 'R
' TD RETYPE FILE NAME DR press
ENTER TD CONTINUE":GDSUB2310:IF
I$="R"GDTD310
440 '
450 GDSUB4340:SDUND10,3:PRINT@12
0," ready THE OUTPUT TAPE, press
RECDRD & PLAY BUTTNS, THEN
press ENTER TD CONTINUE"
460 GDSUB2310
470 OPEN"D",#-1,FI$
480 '
490 'RPT SELECTN MENU
500 GDSUB4340:SDUND10,3
510 PRINT@64,"REP":PRINT@96,"ND
.":PRINT@68,"REQ":PRINT@100,"R
PT":PRINT@104,"REPORT DESCRIPTI
DN";
520 PRINT@160,"(1) yes EXTRACT/L
DAD DIRECTDRIES(2) yes DISKETTE
NAMEB SDRTEd (3) yes DISKETTE
USAGE SDRTEd (4) yes DISKETTE
JACKET LABELS (5) yes DISKETTE
GUM LABELS (6) yes CONSDLIDA
TED DIRECTDRIES(7) yes DISKB DIR
ECTDRY SUMMARY"
530 PRINT@417,"TAP 1-5 TD CANCEL
/REQUEBT FIVE":PRINT@449,"REPDR
TS, REPORTS 6 THRU 7 WILL":PRIN
T@481,"ALWAYS PRINT, PRESS E TD

```

```

EXIT.";
540 X1=1:X2=1:X3=1:X4=1:X5=1:X6=
1:X7=1
550 GDSUB2310
560 IF I$="1" AND X1=0 THEN X1=1
:PRINT@164,"yes"; ELSE IF I$="1"
AND X1=1 THEN X1=0:PRINT@164,"n
o ";
570 IF I$="2" AND X2=0 THEN X2=1
:PRINT@196,"yes"; ELSE IF I$="2"
AND X2=1 THEN X2=0:PRINT@196,"n
o ";
580 IF I$="3" AND X3=0 THEN X3=1
:PRINT@228,"yes"; ELSE IF I$="3"
AND X3=1 THEN X3=0:PRINT@228,"n
o ";
590 IF I$="4" AND X4=0 THEN X4=1
:PRINT@260,"yes"; ELSE IF I$="4"
AND X4=1 THEN X4=0:PRINT@260,"n
o ";
600 IF I$="5" AND X5=0 THEN X5=1
:PRINT@292,"yes"; ELSE IF I$="5"
AND X5=1 THEN X5=0:PRINT@292,"n
o ";
610 IF I$<>"E" THENSDUND10,3:GDT
D550
620 '
630 IFX1=1 DR X2=1 DR X3=1 DR X4
=1 DR X5=1 THENSDUND10,3:GDSUB43
40:PRINT@103," ready THE PRINTER
":PRINT@167," THEN press ENTER
":GDSUB2310
640 '
650 'G E N   O U T P U T   F I L
E   &   P R I N T   R P T   # 1
660 '
670 'INSERT DISKETTE
680 IF LK>55 GDSUB2050
690 PREV$=DISK$:PW$=W$
700 SDUND10,3:GDSUB4340:GDSUB440
0:W$=STR$(TTL+1):W$=RIGHT$(W$,LE
N(W$)-1):PRINT"insert DISKETTE #
":W$;" IN DRIVE 0":PRINT@120,"ty
pe 'STDP' IF NO MDRE DISKETTES";
:IF PREV$<>" THEN PRINT@200,"PR
EVIDUS DISKETTE #":PW$;"":PRINT
PREV$;PERR$
710 PRINT@192,"type DISKETTE NAM
E AND enter:":PRINT@256,E3$;PRI
NT@224,STRING$(20,"."):PRINT@224
,"":LINE INPUT DISK$:E3$="":IF
LEN(DISK$)<1 DR LEN(DISK$)>20 TH
EN E3$=E1$:GDTD700 ELSE I=INSTR(
DISK$,"."):IF I<>0 THEN E3$=E2$:
GDTD700
720 IF DISK$="STDP" DR DISK$="EN
D" DR DISK$="QUIT" THEN SDUND234
,3:PRINT@96,E0$;E4$;GDSUB2310:I
FI$="N"GDTD700 ELSE IF TTL>0 GDT

```

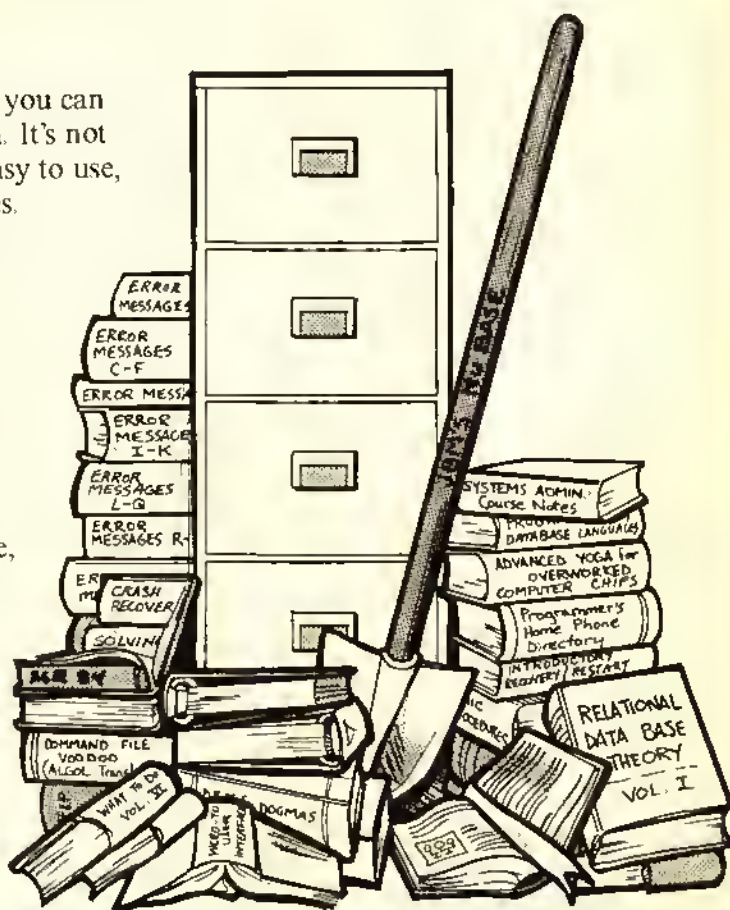
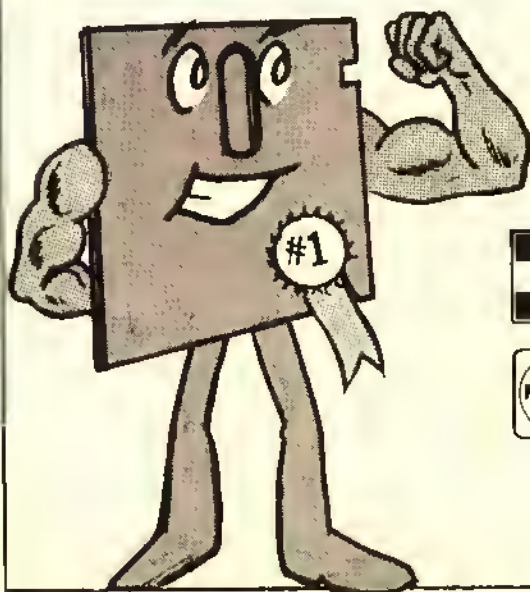

**THROW THE BOOKS AWAY...
ALL of them.**

Introducing NuBASE... the *uncomplicated*
Data Base System from the JBM Group.

NuBASE is a DB manager so versatile that you can use it to do what **YOU** want with your data. It's not complicated or overbearing; in fact it's so easy to use, you'll be up and running virtually in minutes. Simple user-specified masks insure data accuracy. Data integrity is assured through the use of completely crashproof software. *See what you're doing* through the interactive generation of files, screens and reports.

JBM's NuBASE is as affordable as it is complete. There's nothing "else" to buy. . . \$150 brings you the comprehensive package, including a ready-to-use mailing list application to get your NuBASE working for you on *day one*.

The computing power of NuBASE is limited only by the capacity of your hardware.



currently available for OS-9 Level II

For more information or to place an order, contact:

Dept. RB 14

the **JBM**
GROUP

The JBM Group, Inc.
Continental Business Center
Front & Ford Streets
Bridgeport, PA USA 19405
TEL: 215-337-3138
TWX: 510-660-3999



PA res. add 6% sales tax.

US orders, add \$5.00 postage and handling.

```

02430 ELSE G0BUB4340:ENO
730 $DISK$=DISK$
740 IF LEN($DISK$)<20 THEN DISK$=
$DISK$+" ":GOTO740
750 TTL=TTL+1
760 PRINT@224,$DISK$;STRING$(20-
LEN($DISK$),".");"<=PROCESSING";
770 PERR$=""
780 IFR6$="X" THEN R6$=" " ELSE R6$=
"X"
790 '
800 'PRINT HDNG RPT #1
810 IF X1=0 GOTO910
820 IFOF=0 THEN OF=1:PRINT#-2,TAB(
13);CHR$(14)"extract & load dire
ctories";CHR$(20):PRINT#-2:PRINT
#-2:LK=3
830 PRINT#-2,TAB(8)DATE$;" OISK
ETTE ";CHR$(14);$DISK$;CHR$(20)
840 PRINT#-2,TAB(5);:FOR N=1 TO
68:PRINT#-2,"="";NEXT N
850 PRINT#-2:PRINT#-2,TAB(5)"nam
e"TAB(14)"ext"TAB(18)"1"TAB(20)"
2"TAB(22)"fqn"TAB(27)"fqn"TAB(32
)"fqn";
860 PRINT#-2,TAB(37)"lgn"TAB(42)
"lgn"TAB(46)"ns1t"TAB(52)"lgn";
870 PRINT#-2,TAB(56)"nb1s"TAB(63
)"ng"TAB(71)"nb"

```

```

880 LK=LK+3
890 '
900 'READ OIRECTORIES
910 OSKI$ DR,17,2,01$,02$ 'GRAN
B
920 FB$=LEFT$(G1$,68)
930 FOR I=1 TO 68:GR(I-1)=ASC(MID$(
FB$,I,1)):NEXT I
940 FOR X=3 TO 11
950 DSKI$ OR,17,X,A$,B$ 'OIRECT
ORIES
960 C$=A$+LEFT$(B$,127) '1ST B
IN C$
970 AA$=A$+LEFT$(B$,120)
980 FOR N=0 TO 7
990 O$=MID$(C$,N*32+1,32) '32 C
HUNKS
1000 GR=ASC(MID$(AA$,N*32+14,1))
1010 F10=GR
1020 FT$=MID$(AA$,N*32+12,1)
1030 IF LEFT$(O$,1)=CHR$(255) GO
TO1240 'OONE
1040 IF LEFT$(O$,1)=CHR$(0) GOTO
1160 'UNUSEO
1050 FOR I=1 TO 68
1060 IF GR(OR)<128 THEN GR=GR(OR
):NEXT I
1070 IF ASC(FT$)=2 GOSUB 2090 '
CALC ML ADDR
1080 N$=MID$(D$,1,8):E$=MID$(D$,
9,3)
1090 IF X1 THEN PRINT#-2,TAB(5)N
$;" "E$;
1100 FOR S=12 TO 16 'NEXT 4 ENT
RIES
1110 F$=MID$(D$,S,1)
1120 F=ASC(F$)
1130 ON S-11 GOSUB1460,1500,1550
,1740
1140 NEXT S
1150 IF ASC(FT$)=2 AND X1=1 GOSU
B2270 'PRINT ML ADDR
1160 NEXT N
1170 NEXT X
1180 IFBU<0 THENBU=0
1190 IFBA<0 THENBA=0
1200 IFBU<0 THENBU=0
1210 IFBA<0 THENBA=0
1220 '
1230 'PRNT OISKETTE TOTALS RPT #
1
1240 IF X1=0 GOTO1380 'NOT REQS
TO
1250 SOUND10,3:CLS:GOSUB4340:PR
INT"remove "';$DISK$;" ":PRINT"DI
SKETTE FROM DRIVE 0 AND FILE IT
AWAY IN YOUR STORAGE BOX":PRINT
@224,"get ready FOR NEXT OISKETT
E"

```

YORK 10[®]

CASSETTES



COMPUTER GRADE
• DATA TRAC •
BLANK CASSETTES

C-05, C-06, C-10, C-12, C-20, C-24, C-32

From the leading supplier of Computer Cassettes, new, longer length C-12's (6 minutes per side) provide the extra few feet needed for some 16K programs.

- BASF-LHO (DPS) world standard tape
- Premium 5 micron shell with leaden
- Internationally acclaimed. Thousands of 1000's sold.
- Erson First • Money back guarantee

Call: 818/700-0330
FOR IMMEDIATE DELIVERY
on Credit Card Orders.

BUY THE BEST, AT FACTORY-DIRECT PRICES

* 500 C-12's or C-10's — 30 each
• 500 boxes 132 ml • Shipping \$17.50
• 500 boxes 132 ml • Shipping \$10.00
(Free Caddy after 100 boxes not apply)

CASSETTE STORAGE CADDY
Holds 12 cassettes
• 88 PS
• 40 boxes
Includes edge labels
and index card

FREE
1 CADDY WITH EVERY
1000 CASSETTES PURCHASED
(Does not apply to 500 quantity orders)

NEW TRACTION FEED • ONE-CUT
BLANK CASSETTE LABELS
• 1000's • \$3.00/1000 • \$3.00/1000
Red, Blue, Green, Yellow, Lavender
\$4.00/1000 • \$3.00/1000

ORDER NOW... MAIL TO —
YORK 10 9525 Vassar Ave. #R1
Chatsworth, CA 91311

ITEM	1 DOZEN	2 DOZEN	TOTAL
C-05	7.00	13.00	
C-06	7.00	13.00	
C-10	7.50	14.00	
C-12	7.50	14.00	
C-20	8.75	16.50	
C-24	8.00	17.00	
C-32	11.00	24.00	
Hard Box	2.50	7.00	
WPC Labels	0.00/1000	20.00/1000	
Color Labels	0.00/1000	30.00/1000	
Caddy			
Storage Caddy @ 2.95 ea. C-12			
Cart (includes 100 tapes)			
Shipping handling			3.50
Outside 48 Continental States — Additional \$4 per caddy per doz. cassettes or boxes			
TOTAL			

Each cassette includes 2 labels only. Boxes sold separately in Continental U.S. shipment by U.P.S. If Parcel Post preferred check here ☐

Check or M.O. enclosed ☐ Send Quantity Discounts ☐

Charge to credit card, VISA ☐ MASTERCARD ☐

Card No. _____ Exp. _____

Name _____

Address _____

City _____ State/Zip _____

Signature _____ Phone _____

Ask about our DUPLICATING SERVICE


```

1260 IF LK>55GGSUB2020
1270 PRINT#-2,TAB(5);:FOR N=1 TO
68:PRINT#-2,"=";:NEXT N
1280 PRINT#-2
1290 PRINT#-2,TAB(15)"used no
t used [granule=2,304 bytes,9
sectors,1/2 trk]"
1300 PRINT#-2,TAB(5);:PRINT#-2,U
SING"% %###,### ###,###"
;"grans:",GU,GA;
1310 PRINT#-2,TAB(34)"1=file-typ
e 2=file-format f=first l=last"
1320 PRINT#-2,TAB(5);:PRINT#-2,U
SING"% %###,### ###,###"
;"bytes:",BU,BA;
1330 PRINT#-2,TAB(34)"g=grans t=
track s=sect b=bytes n=number"
1340 PRINT#-2:PRINT#-2
1350 LK=LK+6
1360 '
1370 'STORE DISKETTE TABL
1380 DN$(TTL)=DISK$:FU(TTL)=FU:BU
U(TTL)=BU:BA(TTL)=BA:GU(TTL)=GU:
GA(TTL)=GA:FE(TTL)=FE
1390 FU=0:BU=0:BA=0:GU=0:GA=0:FE
=0
1400 '
1410 'INSERT NEXT DISKETTE
1420 GOTO680
1430 '
1440 'G G S U B S :
1450 '
1460 IF F<4 THEN HF=F ELSE HF=1
'FILE TYPE
1470 IF X1 THEN PRINT#-2," ";FT$
(HF);
1480 RETURN
1490 '
1500 IF F=255 THEN R$="A" ELBE R
$="B" 'FILE FORMAT
1510 IF X1 THEN PRINT#-2," ";R$;
1520 RETURN
1530 '
1540 'GET SECTORS/TRKS/BYTES
1550 FB=F:FT=INT(F/2) '1ST GRAN
& TRK
1560 IF FT>=17 THEN FT=FT+1 'AD
J FOR DIR
1570 A=(F AND 1):IF A=0 THEN FS=
1 ELSE FS=10 '1ST SEC
1580 TG=1:GA=F 'GRAN CNTR & GRA
N ADD
1590 GOSUB 1700 'GET NEXT GRAN
1600 IF LG>67 GOTO1620 'LAST GR
AN
1610 TG=TG+1:GA=LG:GOTO1590 'NG
T LAST GRAN
1620 LT=INT(GA/2):IF LT>=17 THEN

```

```

LT=LT+1 'LAST TRK
1630 NS=(LG AND 15) 'SEC LAST G
RAN
1640 A=(GA AND 1):IF A=0 THEN LS
=1 ELSE LS=10 'LAST SEC BTRT
1650 LS=LS+NB-1:LG=GA 'LAST GRA
N & SEC NG.
1660 BG=(NS-1)*256 'BYTES LABT
SEC-1
1670 RETURN
1680 '
1690 'NEXT GRAN
1700 N1$=MID$(G1$,GA+1,1)
1710 LG=ASC(N1$):RETURN
1720 '
1730 'PRNT DETAIL LINE RPT #1, C
REATE OUTPUT FILE
1740 S=S+1
1750 F$=MID$(D$,S,1) 'NEED LAST
BYTE(15) ONLY
1760 LB=ASC(F$)
1770 TB=(TG-1)*2304+BG+LB
1780 IFTG<+1THENTG=0
1790 IFTB<+1THENTB=0
1800 DB=DB+TB:GU=GU+TG:GA=68-GU:
BU=BU+TB:BA=156672-BU
1810 IF X1=0 GOTO1860
1820 'PRINT DETAIL LINE
1830 PRINT#-2,USING" ### ";FG,FT

```

YORK 10[®] DISKETTES

**BRAND NAME QUALITY
"DOUBLE DENSITY"
AT DISCOUNT PRICES!**

"Plain Wrap"
\$159.^{ea.}

• Certified 100% Error-free •
5 YEAR WARRANTY


BASF \$219.^{ea.}
qualimetric • 5 1/4" SSDD, Soft sector, price per disk, 100 pak


Dysan \$269.^{ea.}

TRACTOR FEED DISKETTE LABELS
1 7/8" x 5"

2¢ EACH
1000 QUANT.

FLIP "N" FILE "15" \$795
for 5 1/4" Diskettes
"25," \$21.95 "50," \$31.95

Call: 818/700-0330 **ORDER NOW... MAIL TO -**
 FOR IMMEDIATE DELIVERY **YORK 10** 9525 Vassar Ave. #R1
 on Credit Card Orders. Chatsworth, CA 91311

PLEASE INDICATE QUANTITIES DESIRED					TOTAL	All Diskettes are soft sector, unformatted in Continental U.S. shipments by U.P.S. If Parcel Post preferred, check here <input type="checkbox"/> Check or M.O. enclosed <input type="checkbox"/> Send Quantity Discounts <input type="checkbox"/> Charge to credit card VISA <input type="checkbox"/> MASTERCARD <input type="checkbox"/> Card No. _____ Exp. _____ Name _____ Address _____ City _____ State/Zip _____ Signature _____ Phone _____
SIZE	Plain Wrap	BASF	Dysan			
5 1/4" 3500	17.90	24.90	29.90			
	158.00	218.00	258.00			
5 1/4" 0500	30.20	33.80	41.30			
	182.00	209.00	253.00			
5 1/4" 05800	17.80	21.00	25.50			
	421.00	471.00	467.00			
5 1/4" SSDD	30.90	35.70	35.70			
	274.00	314.00	314.00			
5 1/4" SSDD	36.80	41.20	41.20			
	228.00	263.00	263.00			
DISKETTE LABELS 1/2 3/4 00-100 1/2 3/4 00-1000						
FLIP "N" FILE 5 1/4" "15" \$7.95 qty _____ "25" \$21.95 qty _____ "50" \$31.95 qty _____						
SUB TOTAL						
<small>Can't relocate add extra 10¢ Shipping/handling (only outside)</small>					3.50	
<small>Dynalab All Continental States Additional \$1 per 10 disk. per pk.</small>						
TOTAL						

```

,F8,L6,LT,NS,LS,LB,TB;
1B40 PRINT#-2,USING"###,###";TB
1B50 LK=LK+1
1B60 FU=FU+1
1B70 IF LK>55 GDSUB2020
1B80 'OUTPUT FILE
1B90 R3$=STR$(HF):R3$=RIGHT$(R3$,1) 'FILE TYPE
1900 TFT(HF)=TFT(HF)+1 'FILE TYPE TOTALS
1910 R4$=STR$(TG):IF LEN(R4$)>2 THEN R4$=RIGHT$(R4$,2) 'GRANS
1920 IF LEN(R4$)<2 THEN R4$=" "+R4$:GOTD1920
1930 R5$=STR$(TB):IF LEN(R5$)>6 THEN R5$=RIGHT$(R5$,6) 'BYTES
1940 IF LEN(R5$)<6 THEN R5$=" "+R5$:GOTD1940
1950 IF LEFT$(N$,1)=" " THEN N$="?" +RIGHT$(N$,7)
1960 REC$=N$+E$+R$+R3$+R4$+R5$+DISK$+R6$
1970 PRINT#-1,REC$
1980 'GO BACK TO LOOP
1990 RETURN
2000 '
2010 'PAGE OFLO RPT #1
2020 IF LK=66 GOTD 2060 'PAGE D FLO
2030 PRINT#-2:LK=LK+1:IF LK=66 GOTD2060
2040 PRINT#-2,TAB(3)" ";SDISK$;" ' continued to next page":LK=LK+1:IF LK=66 GOTD2060
2050 PRINT#-2:LK=LK+1:IF LK<>66 GOTD2050
2060 LK=0:RETURN
2070 '
2080 'CALC ML ADDR
2090 L1G=GR(GR):L2S=L1G AND 31:L=L=GR
2100 L3B=ASC(MID$(AA$,N*32+16,1))
2110 IF F1G<34 THEN TN=INT(F1G/2) ELSE TN=INT(F1G/2)+1
2120 S1N=1+(F1G AND 1)*9
2130 DSKI$DR,TN,S1N,A1$,B1$
2140 BP=ASC(MID$(A1$,4,1))*256+ASC(MID$(A1$,5,1))
2150 BP$=HEX$(BP):BP$=STRING$(4-LEN(BP$),"0")+BP$
2160 EP=BP+ASC(MID$(A1$,2,1))*256+ASC(MID$(A1$,3,1))-1
2170 EP$=HEX$(EP):EP$=STRING$(4-LEN(EP$),"0")+EP$
2180 IF LL<34 THEN TN=INT(LL/2) ELSE TN=INT(LL/2)+1
2190 S1N=(LL AND 1)*9+L2S
2200 DSKI$DR,TN,S1N,A1$,B1$:A1$=

```

```

A1$+LEFT$(B1$,127)
2210 IF L3B<2 THEN EA=0 ELSE EA=ASC(MID$(A1$,L3B-1,1))*256+ASC(MID$(A1$,L3B,1))
2220 EA$=HEX$(EA):EA$=STRING$(4-LEN(EA$),"0")+EA$
2230 IF EA$="0000" THEN EA$="????" 'UNKNOWN EXEC ADDR
2240 RETURN
2250 '
2260 'PRNT ML LINE RPT #1
2270 PRINT#-2,TAB(23)"ram address for start,end,exec = ";BP$;"",EP$;"",EA$
2280 LK=LK+1
2290 RETURN
2300 '
2310 I$=INKEY$:IF I$="" GOTD2310
2320 RETURN
2330 '
2340 'PRINTER EJECT
2350 IFLK>65 THEN LK=0
2360 IFLK=0 THEN RETURN
2370 IFLK<66 THEN PRINT#-2:LK=LK+1:GOTD2370
2380 LK=0:RETURN
2390 '
2400 'P R N T   D I S K E T T E
      R P T S   # 2 , # 3
2410 '
2420 'RPT #2, PASS 1: DISKETTE NAMES
2430 IFX1=1GDSUB2350 'EJECT IF PREV RPT
2440 L$="names" 'REPDRPT #2 HEAD ING
2450 GOSUB4340
2460 '
2470 'SORT DISKETTES TABLE (2 PASSES)
2480 PRINT"SORTING DISKETTE ";L$;" REPORT...";
2490 FOR J = 1 TO TTL
2500 FOR K = J TO TTL
2510 IF R2=0 AND DN$(J) < DN$(K) GOTD2560
2520 IF R2=1 AND BU(J) < BU(K) GOTD2560
2530 T1$=DN$(J):T2$=FU(J):T3$=BU(J):T4$=BA(J):T5$=GU(J):T6$=GA(J):T7$=FE(J)
2540 DN$(J)=DN$(K):FU(J)=FU(K):BU(J)=BU(K):BA(J)=BA(K):GU(J)=GU(K):GA(J)=GA(K):FE(J)=FE(K)
2550 DN$(K)=T1$:FU(K)=T2$:BU(K)=T3$:BA(K)=T4$:GU(K)=T5$:GA(K)=T6$:FE(K)=T7
2560 NEXT K:NEXT J
2570 '

```



```

2580 'PRNT DISKETTES RPTS #2, #3
2590 PT=INT((TTL/55)+.9999999)
2600 IF (X2=1 AND R2=0) OR (X3=1
AND R2=1) THEN PRINT"PRINTING D
ISKETTE ";L$;" REPORT..";
2610 FOR J = 1 TO TTL
2620 IF X2=0 AND R2=0 GOTO2610
'TO ACCUM
2630 IF LK=0 GOTO2670
2640 IF LK<60 GOTO2740
2650 PRINT#-2:LK=LK+1
2660 IF LK<>66 GOTO2650
2670 PK=PK+1
2680 PRINT#-2,TAB(5)DATE$;TAB(21
);CHR$(14);"diskette ";L$;CHR$(2
0)TAB(46)"page";PK;"of";PT
2690 PRINT#-2
2700 PRINT#-2,TAB(5)"diskette";T
AB(25)"no. of bytes
bytes grans grans"
2710 PRINT#-2,TAB(5)"name";TAB(2
6)"files used unused
used unused"
2720 PRINT#-2,TAB(5)"=====";T
AB(25)"=====";TAB(38)"=====";T
AB(49)"=====
=====
=====
2730 LK=5
2740 PRINT#-2,TAB(5)DN$(J);TAB(2

```

```

5);:PRINT#-2,USING"###,###";FU(J)
;
2750 PRINT#-2,TAB(33);:PRINT#-2,
USING"###,###,###";BU(J);
2760 PRINT#-2,TAB(45);:PRINT#-2,
USING"###,###,###";BA(J);
2770 PRINT#-2,TAB(56);:PRINT#-2,
UBING"###,###";BU(J);
2780 PRINT#-2,TAB(63);:PRINT#-2,
USING"###,###";GA(J);
2790 IFFE(J)=1THENFE$="1":PRINT#
-2,TAB(71)"note" ELBE PRINT#-2,"
"
2800 LK=LK+1
2810 G1=G1+FU(J):G2=G2+BU(J):G3=
G3+BA(J):G4=G4+BU(J):G5=G5+GA(J)
2820 NEXT J
2830 '
2840 'PRNT TOTALS RPTS #2, #3
2850 IF X2=0 AND R2=0 GOTO2920
2860 PRINT#-2
2870 PRINT#-2,TAB(5)" totals: "
;
2880 PRINT#-2,USING"###,### ###
,### ###,###,### ###,###,### ##,
### ##,###";TTL,G1,G2,G3,G4,G5
2890 LK=LK+2
2900 IFFE$="1"THENPRINT#-2:PRINT

```

The Companion

Expansion Interface Units
Basic Technology offers you
the most features and best
quality for the money!

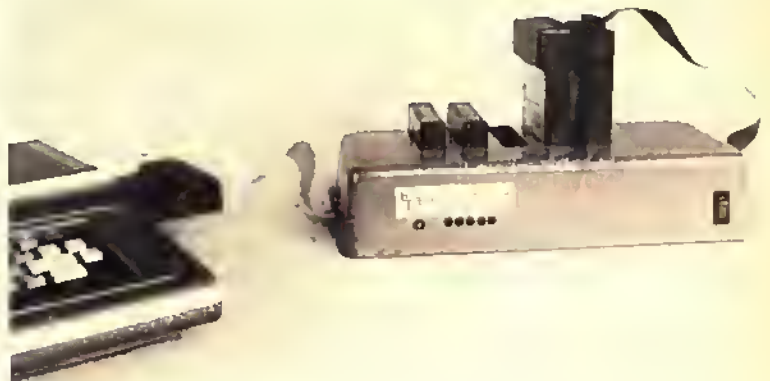
Compare these features:

	BT COMPANION	TRS-80 Multi-Pak
• Power ON Indicator Light	YES	NO
• Cold Start Reset	YES	NO
• Gold Socket Connectors	YES	NO
• Socketed Integrated Circuits	YES	NO
• Manual Cartridge Selector	Pushbutton	Slide Switch
• Keyboard/Program Selection	YES	NO
• Cartridge ON Indicator	YES	NO
• Extension Cable	YES	NO
• Warranty	180 days	90 days
• User's Manual w/schematics, parts layouts and parts lists	YES	NO

Also for the Color Computer:

BT-1010 Parallel Printer Interface ... \$ 79.95
BT-1020 Real Time Clock/Calendar ... \$109.00
BT-1030 Versatile Interface Port..... \$ 69.95

Add \$5 shipping and handling. Check, money order, VISA,
MC (Account # and expiration date). COD charge \$2 (req
certified check or M.O.). Michigan residents add 4% sales
tax.



The Companion — New Price .. \$225.00

BT-1000 \$250.00

with 8K RAM \$275.00



**ORDER TODAY OR SEND
FOR FREE BROCHURE!**

**basic
TECHNOLOGY**

Dept. O

P.O. Box 511

Ortonville, MI 48462

(313) 627-6146

```

#-2,TA8(12)"note: disk READ ERRO
R encountered on this diskette":
LK=LK+2
2910 '
2920 IF R2=1 GOTO3020 'END RPT
#3 (PASS 2)
2930 '
2940 'RPT #3, PASS 2: DISKETTE U
SAGE
2950 IFX2=1GOSUB2350 'EJECT IF
PREV RPT
2960 IFX3=0GOTO3010 'NOT REQSTD
2970 R2=1:PK=0:L$="usage":PRINT@
192,"";:G1=0:G2=0:G3=0:G4=0:G5=0
:GOTO2480
2980 '
2990 'G E N D S K O U T P U
T
3000 '
3010 'CLOSE & READ TAPE JUST CRE
ATD & LOAD TO DSK
3020 PRINT#-1,"END OF FILE":CLOS
E#-1
3030 GOSUB4340
3040 PRINT"remove YOUR LAST PROC
ESSED DI8K":PRINT@160,"insert DI
SKETTE WHICH CONTAINS ALL DIR P
ROGRAMS INTO DRIVE 0":PRINT@256,

```

```

"rewind TAPE & press PLAY BUTTON
AND THE FILE FROM CASSETTE TAPE
WILL BE TRANSFERRED TO DISK":PR
INT@384,"press ENTER"
3050 SOUND10,3:GOSUB2310
3060 GOSUB4340:PRINT"READING ";
FI$;" TAPE FILE..."
3070 OPEN "I",#-1,FI$
3080 FI$=FI$+".DIR"
3090 PRINT@128,"WRITING ";FI$;"
FILE..."
3100 OPEN "O",#1,FI$
3110 PRINT#1,DATE$
3120 LINE INPUT#-1,REC$
3130 IF REC$="END OF FILE" GOTO3
160
3140 PRINT#1,REC$
3150 GOTO3120
3160 CLOSE#-1
3170 '
3180 'WRITE DISK RPT #7
3190 REC$="TOTALS":WRITE#1,REC$
3200 GOSUB3570
3210 REC$="total diskettes in yo
ur system":WRITE#1,REC$,TTL
3220 GOSUB3570
3230 REC$="total bytes used":WRI
TE#1,REC$,G2
3240 REC$="total bytes not used"
:WRITE#1,REC$,G3
3250 IF (G2+G3) > 0 THEN I=(G2/(
G2+G3))*100:I=I+.5:I=INT(I):REC$
="percentage bytes used":WRITE#1
,REC$,I:I=(G3/(G2+G3))*100:I=I+.
5:I=INT(I):REC$="percentage byte
s not used":WRITE#1,REC$,I
3260 I=G2+G3:REC$="total bytes i
n your system":WRITE#1,REC$,I
3270 GOSUB3570
3280 REC$="total granules used":
WRITE#1,REC$,G4
3290 REC$="total granules not us
ed":WRITE#1,REC$,G5
3300 IF (G4+G5) > 0 THEN I=(G4/(
G4+G5))*100:I=I+.5:I=INT(I):REC$
="percentage granules used":WRI
TE#1,REC$,I:I=(G5/(G4+G5))*100:I=
I+.5:I=INT(I):REC$="percentage g
ranules not used":WRITE#1,REC$,I
3310 I=G4+G5:REC$="total granule
s in your system":WRITE#1,REC$,I
3320 GOSUB3570
3330 REC$="total basic programs"
:WRITE#1,REC$,TFT(0)
3340 REC$="total assembly langua
ge programs":WRITE#1,REC$,TFT(3)
3350 REC$="total machine languag
e programs":WRITE#1,REC$,TFT(2)
3360 REC$="total data files":WRI

```



DATA'PHILE
 207 Melrose Drive
 North Syracuse, New York 13212
 (315) 458-3410
 THE EXCLUSIVE COLOR COMPUTER STORE
 Proudly Presents

PAUSE CONTROL

This development adds new dimensions to your Color Computer. The control allows you to stop the CPU dead in it's tracks. All operations are continued from their stopping point when released. All computer operations are supported (except cassette) including Disk in/out.

Now when the phone rings, you can put your game or other program operations on "hold" until you return to them- picking up where you left off. It can also be used for security, preventing unauthorized use of your computer as well as many other uses.

The kit includes a fully assembled PAUSE CONTROL with complete documentation for installation (solderless connections). Kit installation takes about 15 minutes and anyone can do it. The case must be opened for installation and it works with all versions of the color computer.

The kit is fully tested and has been submitted to RAINBOW for certification.

\$19.95 Check or Money order

THE DATA'PHILE deals exclusively in the Color Computer. We serve the entire New York State area, but can meet your needs wherever you live. We sell the following fine products:

FRANK HOGG FLEX	J&M CONTROLLERS
COMPUTERWARE	OKIDATA PRINTERS
VIP SOFTLAW	TEAC & SHUGART DRIVES
PRICKLY PEAR	COLOR & MONO MONITORS
MARK DATA	CUSTOM PROGRAMMING
TOM MIX	BASIC CLASSES
FUTUREHOUSE	ASSEMBLY CLASSES
TELEWRITER 64	MAGAZINES
DISKS	DISK CLEANERS

Our objectives are service, honesty and personal attention. Our success depends on customer satisfaction. We are in constant development of new products for the color computer. Pricelist included with order.


```

TE#1,REC$,TFT(1)
3370 I1=TFT(0)+TFT(3)+TFT(2):I2=
TFT(1):IF (I1+I2) > 0 THEN I=(I1
/(I1+I2))*100:I=I+.5:I=INT(I):RE
C$="percentage programs":WRITE#1
,REC$,I:I=(I2/(I1+I2))*100:I=I+.
5:I=INT(I):REC$="percentage data
files":WRITE#1,REC$,I
3380 REC$="total programs/files
in your system":WRITE#1,REC$,I
3390 GOSUB3570
3400 REC$="total different versi
ons flagged":WRITE#1,REC$,0
3410 GDSUB3570
3420 IFIDERR=0 GOTO3460
3430 REC$="total diskettes with
disk read errors":WRITE#1,REC$,I
DERR
3440 I=(IDERR/TTL)*100:I=I+.5:I=
INT(I):REC$="percentage diskette
s with disk errors":WRITE#1,REC$
,I
3450 GDSUB3570
3460 REC$="EXTRACT & LOAD DIRECT
ORIES report #1":WRITE#1,REC$,X1
3470 REC$="DISKETTE NAMES sorted
report #2":WRITE#1,REC$,X2
3480 REC$="DISKETTE USAGE sorted
report #3":WRITE#1,REC$,X3
3490 REC$="DISKETTE JACKET LABEL
S report #4":WRITE#1,REC$,X4
3500 REC$="DISKETTE GUM LABELS r
eport #5":WRITE#1,REC$,X5
3510 REC$="CDNSOLIDATED DIRECTDR
IES report #6":WRITE#1,REC$,1
3520 REC$="DISKS DIRECTDRY SUMMA
RY page report #7":WRITE#1,REC$
,1
3530 I=((X1+X2+X3+X4+X5+X6+X7)/7
)*100:I=I+.5:I=INT(I):REC$="perc
entage reports requested":WRITE#
1,REC$,I
3540 REC$="END":WRITE#1,REC$,0
3550 CLDSE#1
3560 GOTO3620
3570 REC$="1":WRITE#1,REC$,0:WRI
TE#1,REC$,0:WRITE#1,REC$,0:RETUR
N
3580 '
3590 'P R N T   D I S K E T T E
      J A C K E T   L A B E L S   R
      P T   # 4
3600 '
3610 'RPT #4: DISKETTE JACKET LA
BELS
3620 IFX3=1GDSUB2350 'EJECT IF
PREV RPT
3630 IFX4=0GOTO4220 'NDT REQSTD
3640 '

```

```

3650 GDSUB4340:PRINT"PRINTING DI
SKETTE JACKET LABELS DIRECTDRY R
EPORT.....";
3660 OPEN"I",#1,FI$
3670 INPUT#1,REC$ 'DATE
3680 INPUT#1,REC$
3690 '
3700 IFREC$="TOTALS"GOTO4170
3710 '
3720 LC=0
3730 DISK$=MID$(REC$,22,20)
3740 FDRY=20TO18STEP-1
3750 IFMID$(DISK$,Y,1)<>" "THENZ
=Y:Y=0
3760 NEXTY
3770 IFZ<1DRZ>19THENW2$=DISK$:GD
TD3790
3780 X=(20-Z)/2:Y=INT(X):W2$=STR
ING$(Y,"")+LEFT$(DISK$,Z):W2$=W
2$+STRING$(20-LEN(W2$)," ") 'CE
NTR HDNG
3790 PRINT#-2,TAB(7);CHR$(14);W2
$;CHR$(20);TAB(34)". " 'HDNG
3800 PRINT#-2,TAB(22)DATE$;TAB(5
2)". "
3810 '
3820 SW=0:LC=2
3830 W1$=LEFT$(REC$,B)

```

THE SOFTWARE HOUSE



DATA GRADE TAPE

(AMPEX 603)
C-10 \$6.95 DOZ 25/\$13.95
C-20 \$8.50 DOZ 25/\$15.95
C-30 \$9.95 DOZ 25/\$17.95
"SPESHUL"

(16 TAPES, HARD BOXES, LABELS
AND STORAGE BOX)
C-10 \$12.95 C-20 \$13.95
C-30 \$14.95

HARD BOXES 25/\$4.50 100/\$15.00
CASS LABELS \$2.75/100 20/1000

SENTINEL BRAND

100% CERTIFIED DISKS

SS/DD BOX OF 10 \$18.95
DS/DD BOX OF 10 \$26.95
SS96TPI BX/10 \$28.95
DS96TPI BX/10 \$37.95

BULK DISKS W/SLEEVES
SS/DD 10/\$16.95 50/\$75.00
DS/DD 10/\$22.95 50/\$110.00

TYVEK SLEEVES

25/\$3.00 100/\$9.00

MEDIA MATE DISK BANK - HOLDS 50 DISKS \$14.95

DISK LIBRARY CASE (HOLD 10 DISKS) \$2.00 EA 10/\$18.00

BIB DISK DRIVE HEAD CLEANER \$8.95

BIB STATIC ELIMINATOR \$4.95

RIBBONS: EPSON MX/FX/RX 70/80 \$7.50 EA. 6/\$39.95
GEMINI 10, 10X 2/\$5.50 DDZ./\$29.95
OKIDATA 8D, 82, 92, 93 2/\$5.50 DOZ./\$29.95
DKIDATA 84, 94 \$6.00 EA. 6/\$30.00

HIGH SPEED DUPLICATION OF DATA,

SPEECH, MONAURAL PROGRAMS CALL OR WRITE FOR PRICE QUOTE

ALL ITEMS 100% GUARANTEED!

ADD \$2.50 FOR S/H. IN MICH. ADD 4% SALES TAX
MAKE CHECK/MONEY ORDER PAYABLE TO "DALLAS COX"
9020 HEMINGWAY REDFORD, MICH 48239

(313) 937-3442

CLUBS AND DEALERS - CALL FOR QUANTITY PRICES

```

3840 IFW1$="++++++"THENW2$="ds
k+read+err":GOTO3900
3850 FORY=8TO1STEP-1 'LEFT JUST
IFY NAME
3860 IFMID$(W1$,Y,1)<>" "THENZ=Y
:Y=0
3870 NEXTY
3880 IFZ<1ORZ>7THENW2$=W1$+"."+M
ID$(REC$,9,3):GOTO3900 'ATTACH
EXT ON BLNK NAME
3890 W2$=LEFT$(W1$,Z)+"."+MID$(R
EC$,9,3)+STRING$(8-Z," ") 'ATTA
CH EXT
3900 PRINT#-2,W2$;" "; 'NAME&EX
T
3910 '
3920 SW=SW+1 'COLUMN 1 TO 4
3930 IFSW=4THENSW=0:PRINT#-2,"."
:LC=LC+1 'COL4
3940 '
3950 HREC$=REC$
3960 INPUT#1,REC$
3970 IFREC$="T0TALS"GOTO4000
3980 IFRIGHT$(REC$,21)=RIGHT$(HR
EC$,21)GOTO3830 'SAME DISKETTE?
3990 '
4000 IFLC<20THENPRINT#-2,TAB(52)
".":LC=LC+1:GOTO4000 'REMAINING

```

```

DOTS
4010 PRINT#-2,STRING$(53,"."):LC
=LC+1
4020 '
4030 IFFOOT=0 GOTO4080
4040 LK=LK+LC '21 OR 42 OR 63
4050 IFLK>50 GOSUB2350
4060 GOTO3700 'NEW DISKETTE
4070 '
4080 FOOT=1 'PRNT FOOTING ONLY
ONCE
4090 PRINT#-2:PRINT#-2,TAB(7)"DI
SKETTE JACKET LABELS directory r
eport"
4100 PRINT#-2,TAB(8)"* cut along
dotted line"
4110 PRINT#-2,TAB(8)"* and inser
t into diskette sleeve"
4120 PRINT#-2,TAB(8)"* or paste
onto diskette sleeve"
4130 PRINT#-2,TAB(8)"* or place
alongside diskette sleeve"
4140 LK=LC+6:GOSUB2350
4150 GOTO3700 'NEW DISKETTE
4160 '
4170 CLOSE#1 'END RPT #4
4180 '
4190 'E N D O F J O B
4200 '
4210 'RPTS #5, #6, #7
4220 IF X4=1GOSUB2350 'EJECT IF
PREV RPT
4230 GOSUB4340
4240 PW$="DIR2":W$="#5,
":IF X5=0 THEN PW$="DIR3":W$="#8
#6, AND #7,"
4250 PRINT"press ENTER TO PROCES
S THE NEXT PROGRAM ";PW$;", FROM
DRIVE 0, FOR PRINTING REPORT";W
$:PRINT"OR press 'E' TO EXIT TO
BASIC"
4260 GOSUB2310
4270 IFI$="E"THENEND
4280 IF X5=1 THEN RUN"DIR2.BAS"
ELSE RUN"DIR3.BAS"
4290 END
4300 '
4310 'M O R E G O S U B S :
4320 '
4330 'SCREEN HONG
4340 CLS2:PRINT@5,"EXTRACT DISKS
DIRECTORY";
4350 PRINT@41,"PROGRAM 1 OF 3 ";
4360 PRINT@96,"";
4370 RETURN
4380 '
4390 'SCREEN FOOTING
4400 PRINT@410," IN CASE OF DISK
READ ERROR ";

```

SuperSpooler

Free your fast computer from your slow printer!

SuperSpooler allows your computer to work on one task while your printer works on another.

- works with any size memory (64K recommended)
- compatible with Telewriter, Ultra 80CC etc., and all BASIC programs
- small 64K version uses only 80 bytes of user RAM
- written in relocatable machine language
- 32K buffer with a 64K system
- selectable buffer size and location
- reprint buffer as many times as you want, when you want
- clear buffer at any time
- check status of buffer
- adjust speed of output to suit your printer and interface
- most features enabled with one keystroke at any time, even during application program execution

\$19.95 U.S. or **\$24.95 Canadian**

Also Available:

SBASIC 1.0—a structured BASIC pre-compiler.

\$19.95 U.S. or **\$24.95 Canadian**

Ordering Information:

Please specify cassette or disk. To order send check or money order, or use VISA or MasterCard. If using VISA or MasterCard, include card number and expiration date.

For UPS delivery add \$1 in Ontario and Montreal.

\$3 in the U.S.

Ontario residents add 7% sales tax.

To order or for more information please write,

Tandar Software

12 Araman Drive Agincourt, Ontario Canada M1T 2P6 (416) 293-2014

DEALER INQUIRIES WANTED




```

4410 PRINT@450," type 'GOTO5000'
THEN enter ";
4420 PRINT@96,"";
4430 RETURN
4440 '
4450 'DISK READ ERROR, USER MANU
ALLY GOTO'S HERE
5000 SOUND10,3:GOSUB4340:PRINT@1
33," WAIT ONE MOMENT..... ";:FU
=0:BU=0:BA=0:GU=0:GA=0:IOERR=IOE
RR+1:FE=1:PERR$=CHR$(127)+CHR$(1
28):PERR$=PERR$+"disk":PERR$=PER
R$+CHR$(128):PERR$=PERR$+"err"
5010 REC$="++++++00000000
"+DISK$+R6$
5020 PRINT#-1,REC$
5030 IFX1=0 GOTO5070 'NOT REQST
D
5040 PRINT#-2,TAB(12)"++++ disk
READ ERROR encountered on this d
iskette ++++"
5050 PRINT#-2,TAB(12)"+++++ gran
ules and bytes will not be accum
ulated ++++"
5060 LK=LK+2
5070 GOTO1240
5080 GOTO5000 'FOR 'STRIPPER' P
ROGRAM
5090 '
5100 PMODE0:PCLEARP:GOTO70
5110 'E N D

```



About Your Subscription

Your copy of THE RAINBOW is sent second class mail and, for subscribers in the United States, the date of mailing is printed on the label. If you do not receive your copy by the 5th of the month of the publication date, send us a card and we will mail another immediately via first class mail.

You must notify us of a new address when you move. Notification should reach us no later than the 15th of the month prior to the month in which you change your address. Sorry, we cannot be responsible for sending another copy when you fail to notify us.

Your mailing label also shows an "account number" and the subscription expiration date. Please indicate this account number when renewing or corresponding with us. It will help us help you better and faster.

For Canadian and other non-U.S. subscribers, there may be a mailing address shown that is different from our editorial office address. Do not send any correspondence to that mailing address. Send it to our editorial offices at P.O. Box 385, Prospect, KY 40059. This applies to everyone *except* those whose subscriptions are through our distributor in Australia.



Submitting Material To the Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs which will be useful/helpful/fun for other CoCo owners.

Program submissions must be on tape or disk and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs. All programs should be supported by some editorial commentary, explaining how the program works. We're much more interested in how your submission works and runs than how you developed it. Programs should be learning experiences.

We do pay for submissions, based on a number of criteria. Those wishing remuneration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a SASE to: Submissions Editor, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We will send you some more comprehensive guidelines.

Please do not submit programs or articles currently submitted to another publication.

your best buys!

are with **SOUTHWESTERN DIGITAL**

DISK DRIVES

DRIVE 0 40 track single sided	\$279.
DRIVE 1 40 track single sided	\$189.
DRIVE 0 and 1 SS/DD	\$428.
(add \$70. for double sided drives)	



MEMORY

64K KIT (8 chips)	\$45.
-------------------	-------



PRINTER ADAPTERS

PBH SERIAL TO PARALLEL ADAPTER	\$50.
--------------------------------	-------

KEYBOARDS

HJL Keyboard	\$69.
Micronix Keyboard	\$69.
Keytronic Keyboard	\$79.

DISKETTES

VERBATIM box of 10	\$20.
--------------------	-------



Southwestern Digital

1-713-480-3296

2515 W. Main #337, Houston, Texas 77098

Ordering Information

All prices reflect a pre-made discount for cash. Visa MasterCard orders are at regular price (add 5%).

Mail your payment directly to us, or call your order in today. All non-certified funds are held for proper clearance.

Let your computer find the end of that file with this . . .

CLOAD Command Fixer

By Curt Chadwick

This article is dedicated to all of you out there with 64K, no disk, and a desire to learn assembly language programming. I don't have a disk either, and I spend a great deal of my computer time waiting for my worn but, trusty cassette recorder to save and load programs. One thing about BASIC that has always bothered me is the CLOAD command. How annoying to get an "I/O Error" and then have to keep typing CLOAD, or whatever method you might have devised to get to the beginning of the next program.

I've seen some rather unusual methods used to find the beginning of the next program. There's "Fast Fingers Fred" who manipulates the cassette buttons so fast as to find the break. Or . . . you could use the audio and motor commands to find the end. I leave the play button down and pull the earphone and remote plugs to find the end of the program which drives my wife crazy with the computer squawk coming from the recorder.

Wouldn't it be nice to just type CLOAD and have the computer search for the end of the file for you? Now that you have 64K it's time to put it to work. With 64K, BASIC is now in RAM! What that means is that if you would like to change BASIC you can! What is it about BASIC that you

would like to change? I've already told you what I would like to change — the CLOAD command.

I've had my CoCo now for two years and have had as one of my objectives to learn at least some assembly language programming. To accomplish that objective I decided to try and understand the CLOAD command and learn enough assembly language to perform the patch. When I started looking in BASIC to find the subroutine that handles the CLOAD command there wasn't much help available except from members of my local computer club, which I would like to take this opportunity to thank. Now, there are magazines which publish or advertise a disassemble of the BASIC ROM. I've found that, for the beginner, they may lack many details and leave gaps in the explanation of what goes on in BASIC. If you compare comments by different authors, you might even think they were talking about separate subroutines. However, they are the best place to start.

There are also books which can help. Lance Leventhal's book *6809 Assembly Language Programming* and *TRS-80 Color Computer Assembly Language Programming* by William Barden, Jr. The subroutines for the cassette I/O start around &HA6F3 and go all the way to &HA880. By the way the "&H" means Hex numbers. They may be foreign for awhile, but you do get used to them. Those subroutines are called by many different BASIC routines and the problem is to find the CLOAD command routine and then look for a way to "fix" it.

First, let's take a look at the tape format. Check the back of *Going Ahead With Extended Color BASIC* for the ROM subroutines. The WRTLDLDR turns on the cassette and writes a leader. BLKOUT writes a block to cassette and there are other names like BLKTYP, CBUFAD, and several others.

(Curt Chadwick holds a B.S. in mechanical engineering and is a major accounts manager for Caterpillar Tractor Co. He bought the CoCo for his family in 1981 and says he owes a lot of his knowledge and enjoyment to the Peoria Color Computer Club.)

If those names mean anything to you, or you understand the ROM subroutine section of the manual, then you probably won't need to read this article. When I started my goal to learn more about the computer and learn some assembly language, that ROM subroutine section was a mystery.

The listing below is a less mysterious representation of the tape format. The terms such as leader, sync byte, and so on should begin to mean something. The tone you hear is generated by 128- &H55's. A &H55 in binary is alternating ones and zeros which generates a tone to get the computer in sync with the tape.

Note the block type byte.

EXAMPLE:

55---55 55 3C 0 F F I L E N A M E 2 0 0 2000 2400 2000 A2

128 - &H55's	Leader, the familiar tone at the beginning
Leader byte	1 Byte &H55 Make sure the tape is up to speed
Sync Byte	1 Byte &H3C Signals the start of a block
Block type	1 Byte 0=Title Block
File name	8 Bytes Padded with &H20 if needed
File type	1 Byte: 0=Basic 1=Data 2=M1.
Data type	1 Byte: 0=Binary &HFF=ASCII
Gap	1 Byte flag 0=Continuous flow &HFF=Gap(s)Data)
MSB	Starting address(M1)
LSB	
MSB	Load address(M1)
LSB	
Check Sum	Number of bytes

55---55 55 3C 1 F F DATA..(0 to 255 BYTES).. FF

128-&H55's	Second leader tone
Data Block	
&H55	Leader Byte
&H3C	Sync Byte
Block Type	1=Data &HFF=EOF
Block Length	0to&HFF
Data	0 to 255 Bytes
Check sum	Sum of data+block type+block length

ADDITIONAL DATA BLOCKS DO NOT HAVE A LEADER TONE (128-&H55)

EOF BLOCK (End of File)

55 3C FF 00

Gap byte	1 Byte &H55
Sync byte	1 Byte &H3C
Block type	1 Byte &HFF (End of file)
Block Length	00

When you type *CLOAD*, BASIC recognizes it as a reserved word and goes to a table of locations to get the address for that routine in ROM. That ROM address is &H4498, which is partially disassembled in Listing 1. Don't forget, the disassembly is done by a beginner and lines are documented, which may be obvious to more experienced programmers. The routine checks to see if there is an *M* after *CLOAD* because there is no reserved *CLOADM* command. The

CLOADM is actually a subroutine of the *CLOAD* command check, &H44FE. Notice the subroutine at &H4648 called "go search for file" shown in the disassembly "Listing 2." That subroutine is also called in the *CLOADM* subroutine.

The secret to fixing the *CLOAD* command is in the block type. The search for file routine (Listings 2 and 3) reads in a leader and block of data by calling &H4701. The &H4701 subroutine reads a block and puts the block type in &H7C. The ORB checks to see if &H7C is a title block and/or if there are any errors. If it is not a title, then it does an RTS (return from subroutine) and prints an I/O Error. If it is a title block, it compares the title found to the title requested. If it doesn't match, it skips the rest of the file and looks for another title block.

If you start the tape in the middle of a file, of course, the first block read won't be a title block so the routine returns an I/O Error. If we start in the middle of a file, we don't really care if there is an I/O Error until after we find a title block. Also, we should ignore all blocks that aren't title blocks. Sound simple? Well, it is. Look at &H4698. If the program said to ignore I/O Errors and all blocks which are not titles and keep reading blocks until it finds a header, then it would be "fixed."

To fix the routine, you must first move the ROM to RAM with your "move ROM" program that boots 64K. The source code for the "fix" which modifies BASIC is in Listing 4. The program puts a jump in the "go search for file" routine at &H4698 to point to the fix. At Line 180, the fix starts by storing the registers to make sure nothing is disturbed. The rest is fairly obvious. Lines 220-240 are the code which was replaced by the jump. The program is written in position independent code which means it can be put at any memory location and still run. I would suggest adding it on to your move ROM program so that when you boot the 64K the *CLOAD* is patched at the same time. For those of you without an editor/assembler, boot 64K and type in the BASIC program in Listing 5. After you have checked for errors, *RUN* the program. Then save the machine language program by typing *CSAVEM "CLOADMOD", &HFD00, &HFD25, &HFD00*. As I said, you could append the program onto the move ROM program or run it separately.

The program runs without any problems except once in awhile I have gotten an I/O Error by starting in the middle of a file. I speculate that in the data there must be read a &H55 and a &H3C. That triggers a read block which returns a check sum error. Should that ever occur, just type *CLOAD* again. I have never had it happen twice in a row. The fix is designed for 1.1 BASIC and I haven't checked to see if later versions are the same. If they are different, there should be enough discussion and listings so you can figure it out. I hope that by studying how to fix that pesky *CLOAD* I/O Error you have become interested in assembly language and maybe even learned some. I know I have.

Listing 1: "CLOAD routine"

A498	CLR 78	CLEAR FILE STATUS
A49A	CMPL #4A	IS THERE A "M" AFTER
		"CLOAD"?
A49C	BEQ A4FE	IF SO GOTO CLOADM
		ROUTINE
A49E	LEAS S+2	RESTORE STACK AND
		RETURN

A4A0	JSR A5C5	STORE FILE REQUESTED
A4A3	JSR A648	GO SEARCH FOR FILE

Listing 2: "Go search for file"

A648	TST 78	CHECK FILE STATUS
A64A	BNE A61C	IF OPENED ERROR
A64C	BSR A681	"GO LOOK FOR FILE NAME"
A64E	BNE A619	CHECK FOR ERRORS
A650	CLR 79	CLEAR COUNTER
A652	LDX #1DA	LOC OF NAME FOUND

Listing 3: "Go Look For File Name"

A681	LDX #1DA	LOC TO PUT NAME OF FILE
		NAME FOUND
A684	STX 7E	STORE IN BUFFER LOC
A686	LDA 68	CURRENT STATEMENT POINTER
A688	INCA	
A689	BNE A696	IF NOT SKIP
A68B	JSR A928	GO CLEAR SCREEN
A68E	LDX 88	GET CURSER LOC
A690	LDB #53	"S"
A692	STB ,X++	PUT ON SCREEN AND SPACE OVER
A694	STX 88	STORE CURSER LOC
A696	BSR A701	READ LEADER AND BLOCK
A698	ORB 7C	CHECK FOR ERRORS AND TITLE
		BLOCK
A69A	BNE A6D0	RTS AND PRINT ERROR
A69C	LDX #1DA	LOC OF FILE FOUND
A69F	LDU #1D2	LOC OF FILE REQUESTED
A6A2	LDB #8	LOAD COUNTER WITH 8 SPACES
A6A4	CLR ,S	
A6A6	LDA ,X+	LOAD WITH CHARACTER

A6A8	LDY 68	CURRENT POINTER LOC
A6AB	LEAY ,Y	ROUTINE TO COMPARE CHAR OF
		FILE REQUESTED WITH FILE
		FOUND

A6AD	BNE A6B4	
A6AF	CLR 6F	
A6B1	JSR A282	
A6B4	SUBA ,U+	
A6B6	ORA ,S	

A6B8	STR ,S	
A6BA	DECB	
A6BB	BNE A6A6	
A6BD	LDA ,S+	
A6BF	BEQ A6CB	
A6C1	TST ,9,U	
A6C3	BEQ A6CB	IF RIGHT NAME BRANCH DOWN
A6C5	BSR A6D1	IF NOT SKIP REST OF FILE
A6C7	BNE A6D0	IF ERROR RTS

Listing 4:

00100			*MODIFY CLOAD COMMAND
00110	PATCH	NOP	
00120		LDX	#SA698 PUT PATCH IN BASIC
00130		LDA	#\$7E JUMP
00140		STA	,X+
00150		LEAY	START, PCR LOCATION OF
			PROGRAM
00160		STY	,X
00170		RTS	RETURN TO BASIC
00180	START	PSHS	A,B,X,Y, CC STORE
			EVERYTHING
00190		LDA	\$7C GET BLOCK TYPE

**AVAILABLE
NOW**

DRAGON USER

To make the most of your new Dragon microcomputer from Dragon-Tano, you need *Dragon User* — the international, independent magazine for Dragon owners.

Each issue of *Dragon User* contains:

- reviews of the latest software
- programming advice for beginners
- hardware projects

- program listings covering games and utilities
- reviews of Dragon peripherals and add-ons
- technical advisory service
- programming articles for users

The Dragon microcomputer was launched in the UK last year. Since then we have developed a knowledge and mastery of the machine's abilities. You can benefit from our experience by subscribing to *Dragon User*, which is expanding its coverage to include all US developments.

To make sure that you receive a copy of *Dragon User* regularly, subscribe direct to us. This costs only \$29.95 for 12 issues airspeeded to you — or take advantage of our special offer to long-term subscribers. Individual copies of the magazine can be obtained from your Dragon dealer.

Subscription order form. Receive a free book and save money by taking out a long-term subscription — a two-year subscription saves 10%, a three-year subscription saves 20%. In addition, long-term subscribers will receive a free copy of either ☐ *The Working Dragon* or ☐ *Dragon Games Master*. Please send a check, made payable to *Dragon User*, with this form. Start my subscription from the following issue

Name

Address

Signed Date

Subscription rates US and Canada airspeeded ☐ US\$29.95 for 12 issues/1 year
☐ US\$53.90 for 24 issues ☐ US\$71.90 for 36 issues. Send this form to
Dragon User, % Business Press International, 205 E. 42nd St., New York, NY 10017.


```

00200      BNE      REREAD IF NOT TITLE
                                REREAD
00210      PULS     A,B,X,Y,CC PUT
                                EVERYTHING BACK
00220      ORB      $7C FILL IN BYTES
                                REPLACED W/ PATCH
00230      LBNE     $A6D0
00240      JMP      $A69C
00250      REREAD   PULS     A,B,X,Y,CC REPLACE
                                STACK
00260      JMP      $A696 GOREAD
                                ANOTHER BLOCK
00270      END

```

```

A6C9      BRA A686 IF NOT RIGHT FILE START
                                OVER
A6CB      LDA #46 "F" FOR FOUND
A6CD      BSR A6F8 PUT "F" ON SCREEN
A6CF      CLRA
A6D0      RTS

```

Listing 5:

```

1 LISTING 5
2 MODIFY CLOAD COMMAND

```

```

5 READ A5,B5
6 'GET STARTING AND ENDING ADDRESS-
  TO CHANGE ADDRESS CHG THE TWO
  NUMBERS IN LINE 100
7 H$="&H"
8 A=VAL(H$+A5): B=VAL(H$+B5)
9 'CONVERT TO HEX
10 C=B-A+1
15 'DETERMINE NUMBER OF BYTES
  FOR D=1 TO C
25 READ A1$ 'READ BYTES OF DATA
30 POKE A, VAL(H$+A1$)
33 'POKE PROGRAM INTO MEMORY
35 A=A+1: NEXT D
100 DATA FD10,FD24
102 DATA 8E,A6,98
104 DATA 86,7E
106 DATA A7,80
108 DATA 31,8D,00,04
110 DATA 10,AF,84
112 DATA 39
114 DATA 34,37
116 DATA 96,7C
118 DATA 26,0B
120 DATA 35,37
122 DATA 1A,7C
124 DATA 10,26,6A,C6
126 DATA 7E,A6,9C
128 DATA 35,37
130 DATA 7E,A6,96

```



COLOR COMPUTERS

CALL TOLL FREE 1-800-248-3823

COLOR COMPUTER, DISK DRIVE AND PRINTERS

COLOR COMPUTER SOFTWARE

	LIST PRICE	OUR PRICE
26-3136 16K Extended Color Computer 2	\$ 159.95	\$ 149.00
26-3127 64K Color Computer 2	\$ 259.95	\$ 195.00
26-3029 Disk Drive 0 for Color Computer	\$ 349.95	\$ 299.00
26-1161 Disk Drive 1, 2, 3 for Color Computer	\$ 279.95	\$ 230.00
26-1271 DMP-110 50/25 cps Triple Mode Printer	\$ 399.95	\$ 299.00
26-1255 DMP-120 120 cps Dual Mode Matrix	\$ 499.95	\$ 385.00
26-1254 DMP-200 120 cps Triple Mode Matrix	\$ 699.95	\$ 425.00
26-1257 DWP-210 14 cps Daisy Wheel Printer	\$ 599.00	\$ 485.00

Teletwriter 64 Tape	\$ 49.95
Teletwriter 64 Disk	\$ 59.95
VIP Writer	\$ 59.95
VIP Speller	\$ 49.95
VIP Database	\$ 59.95
TOM MIX Software	CALL
RADIO SHACK Software	15% Off
SPECTRAL ASSOCIATES	CALL

OTHER PRINTERS AND ACCESSORIES

MONITORS

	OUR PRICE
EPSON Printer	CALL
OKIDATA Printer	CALL
STAR GEMINI 10X Printer	\$ 300.00
TRANSTAR Daisy Wheel Printer	\$ 465.00
CITOH 8510 Prowriter Printer	\$ 380.00
BOTEK Serial to Parallel Interface	\$ 59.00

	OUR PRICE
COMREX 12" Monitor	\$ 95.00
COMREX 13" Color Monitor	\$ 285.00
AMDEK 300A Monitor	\$ 155.00
AMDEK Color I Plus	\$ 335.00
VIDEO PLUS Monitor Adaptor	CALL
GORILLA Monitor	\$ 85.00

COLOR ACCESSORIES

	LIST PRICE	OUR PRICE
26-2226 RS-232 Program Pak	\$ 79.95	\$ 68.00
26-3012 Deluxe Joystick (EACH)	\$ 39.00	\$ 34.00
26-3017 64K RAM Kit	\$ 69.95	\$ 59.00
26-3025 Color Mouse	\$ 49.95	\$ 42.50
26-1173 Modem II	\$ 199.95	\$ 169.00

	LIST PRICE	OUR PRICE
26-3008 Joysticks	\$ 24.95	\$ 21.00
26-3016 Keyboard Kit	\$ 39.95	\$ 34.00
26-3018 Extended BASIC Kit	\$ 39.95	\$ 34.00
26-1175 Direct-Connect Modem I	\$ 99.95	\$ 65.00
Hayes Modems		CALL

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. For shipping, add 2% (minimum shipping charge \$3.00). C.D.D. excepted. (\$6.00 charge per carton on C.D.D. Call for further C.D.D. information.) M.C., Visa, A.X., add 3%.

PERRY COMPUTERS • 137 NORTH MAIN STREET • PERRY, MI 48872

Playing the Game of Heroic Fantasy

By George Firedrake & Art Canfil
Rainbow Contributing Editors

Anyone can learn how to play by playing-by-mail. We suggest you begin with the game *HEROIC FANTASY*. Your hand-picked cast of characters will explore a labyrinth replete with glittering treasure guarded by hordes of slaving monsters.

Begin by getting the rules. Send \$2 to Flying Buffalo, Inc., Dept. GMA, P.O. Box 1467, Scottsdale, AZ 85252-1467. When you get the rules, create a list of up to 15 characters as your adventuring party. You then enter the game by sending in your group of adventurers along with orders on what they are to do. Soon, Flying Buffalo's computer will tell you what happened, then await further orders. Each set of orders is a *turn*. You can elect to send two turns a week, or one turn a week, or a turn every two weeks, or once a month. We suggest every two weeks for your first game.

There is a set-up fee to enter the game and a turn fee each time you send in a turn. You can do it by good old U.S. mail or via electronic mail on The Source. The \$2 rule book tells all.

Your characters can be human or otherwise. Each character is either a *fighter* or a *magic-user*, but not both. The strength (STR) of a character is used to attack other characters or mons-

ters, to defend oneself and others, cast magic spells, and do numerous other things. The CON (construction) of a character determines the amount of

damage a character can withstand and continue living.

Each character has a price, shown in the following table.

CODE	KINDRED	CLASS	STR	CON	COST
F	Fairy	Fighter	1	1	1
		Magic-user	1	1	2
G	Gremlin	Fighter	3	4	3
L	Leprechaun	Magic-user	3	4	3
H	Hobbit	Fighter	5	15	5
		Magic-user	4	15	7
K	Goblin	Fighter	7	20	6
P	Human	Fighter	15	30	9
		Magic-user	10	30	11
E	Elf	Fighter	25	25	15
		Magic-user	20	25	18
D	Dwarf	Fighter	30	40	23
		Magic-user	30	40	36
O	Ogre	Fighter	35	40	29
		Magic-user	35	40	46
T	Troll	Fighter	50	50	57
X	Giant	Fighter	60	60	72

Ready To Assemble A Party Of Adventurers?

You Have 100 Points To Spend.

As you see, giants are expensive. If you include a giant, you have only 28 points left to spend on lesser creatures. How should you spend your points to get a party of adventurers with a good chance of surviving and thriving in the labyrinth? Here are some hints.

— You will probably need *both* fighters and magic-users.

— STR and CON are important. Try to get lots of both in your party. What is the total STR and the total CON of your group?

— The ratio of STR to COST and CON to COST might be a useful index to help you choose. Here are some examples.

Elf fighter: STR/COST=1.67
CON/COST=1.67

Hobbit
magic-user: STR/COST=.56
CON/COST=2.14

Write a CoCo program to compute STR/COST and CON/COST ratios for all possible characters.

— Load up your CoCo with the information in the table and call it up when needed.

— Write a simple spreadsheet program to help you spend those 100 points effectively. Try out several mixtures of characters. Remember, the bottom line has total STR, total CON, and points spent.

We will sign up for *HEROIC FANTASY* and make a turn every two weeks. We encourage you to join us. Perhaps we will meet in the labyrinth. Every month, we will share our adventure here in *GameMaster's Apprentice* and show you the programs we write to help us play.

Who Is A Character?

A character is any imaginary person or other creature created according to the rules of a game system. The characters you choose in *HEROIC FANTASY* are quite simple. The characters in *Dungeons & Dragons* or *RuneQuest* are much more detailed and complex. Characters in *Adventurer's Handbook* are simplified versions of the kinds of characters found in the very elegant *RuneQuest* system and several other game systems published by Chaosium.

Meet Aloysious Anonymous, who

lives in a village near Triford in Wundervale. He is described by the following *character record*.

Aloysious has basic characteristics, nine skills, and several other things. If we play him in a game and he survives, some of the information will change and more information might be added to his character record.

A game player will have several characters, perhaps dozens of characters, with a character record for each character. Next time, we'll begin building CoCo programs to store, retrieve, delete, edit, and otherwise manipulate information in a file of character records. In the meantime, we'll describe some of the items on the character record.

A character begins with seven basic characteristics.

STR is strength. This is plain old muscle power. It determines how much your character can lift and carry, affects his or her ability to use weapons, and is a factor in all those activities that require brute force.

"Your hand-picked cast of characters will explore a labyrinth replete with glittering treasure guarded by hordes of slaving moustersons."

CON is constitution. It is a measure of health and physical well-being. CON is the most important characteristic in determining the amount of damage your character can take before becoming unconscious or even dying.

SIZ is size. It combines height and weight into one number. Large characters can absorb and dish out more damage during fighting, but find it more difficult to defend themselves, hide, or squeeze through small spaces. Small characters have the opposite advantages and disadvantages.

INT is intelligence. This measures how smart your character is. It is difficult to play a smart character unless you are smart. It is sometimes difficult for a smart person to play a dumb character. Accept the challenge — play the role!

POW is power. This is a measure of your character's psychic ability or potential. A character with higher POW is luckier and more intuitive than a character with lower POW. In a game world that includes magic, POW resists spells cast on your character and is the power source for casting spells.

DEX is dexterity, quickness, and agility. A character with low DEX is clumsy. A character with high DEX is quick, agile, and good at fighting, dodging, running, and doing those things that athletes are good at.

CHA is charisma. This measures your character's ability to persuade, lead, and inspire (or subvert) other characters. It is commonly used when your character tries to talk her way out of a tight spot or convince others to follow her.

For a human character, each characteristic has a value from three to 18. A character with STR 18 is very, very strong. A character with STR 3 is probably too weak to survive in a game. In previous episodes of *GameMaster's Apprentice*, we have shown several ways to obtain values for the seven fundamental characteristics.

A healthy, uninjured character has a number of HIT PTS. equal to his or her CON. This number is circled on the character record. In case of injury or illness, damage to a character is marked off against the character's hit points. If hit points get down to one, the character becomes unconscious. If the hit points reach zero, the character dies.



HEROIC FANTASY™ is a trademark of Flying Buffalo, Inc.

Think of POW points as a battery that powers magic. When a character is fully "charged up," the number of power points is the same as the character's POW. When a character uses magic, power points are spent to make the spell work, if it does work. If power points are reduced to zero, the character dies.

Both hit points and power points are restored by rest, good nutrition, and tender loving care.

Next time, we will describe more of the information on the character record. In the meantime, think about how you would store complete information on a character, change it, retrieve it, add to it, and so on. If you have a printer, perhaps you would like a program to print a blank character record sheet or one with the information for a character included.

TAIPAN: A Game In Context

You begin as a China Trader, operating out of Hong Kong in the mid 1800s. You begin with one small ship and one gun for defense against pirates. You are in debt to Elder Brother Wu, chief of one of the underground Chinese secret

societies. Indeed, Mr. Wu is happy to loan you money, at an exorbitant interest rate.

Your ports of call are Hong Kong, Foochow, Shanghai, Nagasaki, Manila, Singapore, Batavia, Saigon, Calcutta, and Liverpool. Possible cargoes are rice, pepper, arms, tea, silk, and opium. You hope to buy low and sell high.

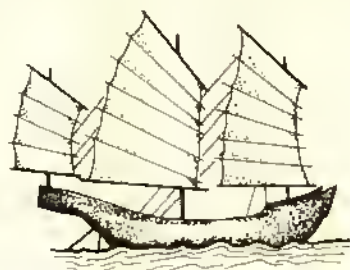
Before you load up and debark from Hong Kong to seek your fortune, you are visited by an emissary of Li Yuen, seeking a "donation" to his favorite charity, the building fund of the temple of Tin Hau, a Chinese Sea Goddess.

Let's face it: most people would consider Li Yuen a pirate. But he fancies himself as X, the head of a private mari-

time protective agency, employing a few thousand rough and ready fellows from many nations, men who might be on the wrong side of the law were it not for Li. He has a huge fleet of armed junks and lorchas patrolling coastal waters and the high seas in order to protect his "clients," those who donate to the temple of Tin Hau.

What cargo will you select? Perhaps a mix of two or more types of goods. Usually, rice is cheapest. Of course, you probably know that throughout Asia, rice is the primary food. But what about those other possible cargoes: pepper, arms, tea, silk, and opium?

Chinese tea was an item of huge economic importance in Europe, especially in Britain. Introduced into China dur-



Setting The Standards

CANDY CO.



Graphics and sound effects like never before on the CoCo. An exciting original arcade action game. Control your hero through a maze of moving conveyor belts. Outsmart bad guys and save O.P. Doll. Over 1,000 frames of increasing difficulty.

100% M.L., original little screen music. 1 or 2 players, colorful Hi Res graphics, exciting sound effects, joystick or keyboard input pause feature. 8 digit scores and high score name entry. For 32K CoCo and TOP-100.

Cassette-34.95

Disk-34.95



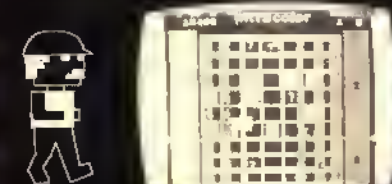
Step yourself into the ultra responsive Formula 1 car and rev the throttle to fire 500 screaming horses to life. Your heart pounds in anticipation of the race. The green flag drops and you are slammed back into your seat as the field thunders off in a deafening roar.

An exciting racing game in colorful Hi Res graphics with realistic sound effects. Joystick or keyboard input. Joystick input is compatible with all joysticks. Many different tracks to choose from. For 32K CoCo and TOP-100.

Cassette-34.95

Disk-34.95

Willy's WAREHOUSE © 1984



Another exciting original arcade action game. Help Willy stock the warehouse while keeping up with incoming orders. Watch out for the antagonists who intend to make your day long.

Excellent graphics and sound effects. 100% M.L., 1 or 2 players, demonstration mode, selectable difficulty, joystick or keyboard input, pause feature and high score list with name entry. For 32K CoCo and TOP-100.

Cassette-34.95

Disk-34.95

COLORPEDE



ROBOTTACK

This truly outstanding engineer designed, 100% M.L. game with multi-colored Hi Res characters and fast action will challenge the most avid arcade buff. 1 or 2 players with joystick or keyboard. COLORPEDE slithers through the load slots. Demonstration mode with top 5 scores. Pause feature. For 16K CoCo and TOP-100.

Cassette-29.95

Disk-34.95

forefront of the pack. RAINBOW, Dec. '82

You are the super human who must fight off the attacking robots and save the remaining humans from destruction. You have super human powers, can shoot in any direction and move anywhere on the screen to accomplish your vital mission.

Engineer designed. 1 or 2 players and top 5 scores displayed. Pause feature. For 16K CoCo and TOP-100 with joysticks.

Cassette-24.95

Disk-27.95

AT YOUR DEALERS NOW. From INTRACOLOR: VISA, MASTERCARD, Money Order. Please allow 2 weeks for checks. Add 1.50 for shipping, 3.00 outside U.S., 4% tax in MI.

intracolor
P.O. Box 1035, East Lansing, MI 48823 (517) 351-8537

DEALER INQUIRIES INVITED

QUALITY PROGRAMS SOLICITED

ing the time of the Han Empire (206 B.C.—220 A.D.), tea was originally considered a medicine, later a pleasing drink as we know it. During the 1700s, tea became the national beverage of the English. Merchants and officials of the Ch'ing dynasty in China, and their British counterparts, reaped huge profits from the tea trade. In the 1800s tea comprised three-fifths of China's exports.

We use pepper to represent spices in general, thus reserving the letter 'S' for silk. To make the game easy to play, we want to use single letters to select items: 'R' for rice, 'P' for pepper, 'A' for arms, and so on. Spices brought the Portuguese to Asia. A desire for a piece of the spice trade motivated the voyages of Christopher Columbus, who found America instead.

Silk also has a long history. The ancient Romans imported so much silk from the Han Empire that the one-sided trade severely damaged the economy of the Roman Empire. Later, Marco Polo followed the inland silk route to China.

In the late 1700s, the British attempted to balance their growing imports of tea and silk with items of export, lest all

British gold and silver end up in China. They chose cotton and opium from India. Since the British controlled India, they could obtain these items cheaply.

Opium was known in China, and used sparingly as a medicine. The importation of vast amounts of this narcotic drug by the British caused the opium habit to sweep across China like a plague. The Chinese tried to suppress the opium trade. England launched the Opium War (1839—1842) in part to maintain the opium trade, even though it was physically, mentally, politically, and economically destructive to the Chinese.

This is the setting in which you, with your tiny ship and one gun, set out to seek your fortune. Will you become a tai-pan?

Game & Hobby Stores

To learn more about role playing games, visit a game and hobby store. Browse the games, books, magazines, dice, and other paraphernalia. Ask for names of GameMasters or Dungeon Masters who might run a beginner's game where you can play.

ROLE PLAYING GAMES

Millions of people play fantasy role playing games. A role playing game is a game in which one or more players create and play characters (adventurers) who live their imaginary lives in a specially made game world. The game world is created, managed, and operated by a Game Master (GM), referee, or dungeon master (DM). Most people who play role playing games use a formal rule system. Some of the best known are shown below.

Champions. Hero Games, 92A 21st Avenue, San Mateo, CA 94402.

Dungeons & Dragons (D&D). TSR, P.O. Box 756, Lake Geneva, WI 53147.

RuneQuest (RQ). Chaosium, P.O. Box 6302, Albany, CA 94706.

Traveller. Game Designer's Workshop, P.O. Box 1646, Bloomington, IL 61701.

Tunnels & Trolls (T&T). Blade, P.O. Box 1210, Scottsdale, AZ 85252.

Beginners beware! The rule books are formidable. If you are a beginner, we suggest you start with one of the following books, both from Reston Publishing Company, 11480 Sunset Hills Road, Reston, VA 22090.

Adventurer's Handbook: A Guide to Role Playing Games by Bob Albrecht & Greg Stafford.

Through Dungeons Deep by Robert Phamdon.

In "Game Master's Apprentice," we include how-to-play information for all beginners.

Copyright © 1984 by DragonQuest, P.O. Box 310, Menlo Park, CA 94026.

Cosmos
COMPUTER SERVICES, INC.

112 W. WISCONSIN AV.
KAUKAUNA, WI 54130
(414) 766-1851

STOCK ITEMS SHIPPED SAME DAY!

THE COSMOS CONNECTION IS A COMPLETE SERIAL TO PARALLEL INTERFACE FOR THE COLOR COMPUTER TO THE GEMINI — 10X AND 15X PRINTERS.

- NO AC REQUIRED
- SWITCHABLE BAUD RATE
- AT: 600
- 1200
- 2400

- HIGH QUALITY CONSTRUCTION
- COMPACT
- 90 DAY WARRANTY

\$60.00

THE GEMINI-10X PACKAGE READY TO PLUG IN TO YOUR COLOR COMPUTER ONLY*

\$325.00

GEMINI-10X PACKAGE**

10X • \$289.00
15X • \$445.00
Delta 10 • \$484.00
Delta 15 • \$597.00



*Plus - U.S. ORDERS Add \$10.00 Shipping & Handling
*Plus - CANADIAN ORDERS Add \$25.00 for Shipping & Handling
**FREE - Shipping & Handling in U.S. with Package Orders
** Plus - CANADIAN ORDERS Add \$15.00 for Shipping & Handling with Package Orders

TRS-80 IS A TRADEMARK OF TANDY CORP

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE

THE COMPLETE TRS-80® LINE

• ELITE CALC \$54.95
• ELITE WORD \$54.95
• ELITE FILE \$67.00
• TOM MIX CALL FOR PRICE
• SOFTWARE FOR PRICE

stair
MICRONICS, INC.

THE POWER BEHIND THE PRINTED WORD.

The best in software for kids!

SEASON'S GREETINGS FROM STEVE, CHERYL, ADAM, DAVID, SHARI AND PRINCESS, THE CAT



THE MONEY SERIES BY STEVE BLTD

DOLLARS & SENSE 16K EGB \$14.95
Player buys familiar items using dollars and coins to practice using money correctly.

MACOCO'S MENU 16K EGB \$14.95
Learn to buy and add up your purchases from a typical fast-food restaurant menu.

MORET-PAK 32K EGB \$22.95
A combined and menu driven version of the above programs. Includes play money. Reviewed - Rainbow 7/83

EQUATIONS TUTOR 32K Ed Guy \$19.95

Elementary Algebra - A step by step tutorial for learning to solve linear equations. 3 levels of difficulty.

GRAPH-IT \$14.95 16K EB.
Graph algebraic equations on a hi-res screen. Linear, quadratic, etc. By O. Steele

DISTANCE PROBLEMS \$19.95
Moving graphics and text combines on a hi-res screen. Rate x Time = Distance in all its forms. 32K E.B.

MATH INVADERS by David Steele 16K EB. \$17.95
A multi-level 'Space Invaders' type game to reinforce the 4 basic math operations (addition, subtraction, multiplication and division). Problems become more difficult as you progress. Hi-res. graphics, joystick required.
TAPE ONLY



BEYOND WORDS 32K EGB \$19.95 Each
These Language Arts programs cover common misspellings, and synonyms/antonyms on each level. Additionally, Level 1 tests contractions and abbreviations, Level 2 tests homonyms, and Level 3 tests analogies. Each program has 3 parts and contains over 400 questions and uses over 800 words. All tests are grade appropriate. User modifiable (directions included). Printer option.

Level 1 Grades 3-5
Level 2 Grades 6-8
Level 3 Grades 9-12
DISK VERSION Each \$23.95

MATH

THE MATH TUTOR SERIES 16K Ext.
These tutorials take the child through each step of the example. All programs include a HELP table, cursor and graphic aids. All allow user to create the example, or let the computer choose. Multi-level. Great teaching programs. By Ed Guy.

LONG DIVISION TUTOR \$14.95

MULTIPLICATION TUTOR \$14.95

FACTORS TUTOR \$19.95

FRACTIONS TUTOR (Addition) \$19.95

FRACTIONS TUTOR (Subtraction) \$19.95

FRACTIONS TUTOR (Multiplication) \$19.95

Any 2 FRACTIONS programs \$29.95

TRIGONOMETRY TUTOR 32K By Ed Guy \$24.95

A step by step tutorial for learning to compute the sides and angles of right triangles. All examples have graphic representation.



GRAPH TUTOR 32K EGB \$19.95
Line, bar, pie and pictographs are demonstrated. Learn to read and use these graphs. Test mode. Hi-res graphics throughout. By Chris Phillips.

CROCODILE MATH 16K Ext. By Art Provost \$17.95

An animated math game using hi-res graphics. A fish containing a problem moves toward a crocodile containing a possible answer. If the answer is true, open the crocodile's mouth with the joystick to eat the fish. If false, keep his mouth closed. Addition, subtraction, and multiplication examples on 3 levels, 3 speeds. Tape only.

LANGUAGE ARTS

(ALL PROGRAMS IN 16-K EXTENDED EXCEPT WHERE NOTED)

CONTEXT CLUES - by Steve Blyn - Multiple choice reading programs. Specify grade 4, 5, 6 or 7. each \$17.95

VOCABULARY BUILDERS - 32K - Great for test preparations. 200 questions, multiple choice, modifiable, printer option. I (grades 3-5), II (6-8) or III (9-12) each \$19.95

READING AIDS 4-PAK - Child creates own reading material. \$19.95

FOREIGN LANGUAGE

FRENCH OR SPANISH BASEBALL - By S. Blyn each \$11.95
Vocabulary practice. 200 words. Modifiable. Specify language. Also in 32K (500 words) \$19.95

HEBREW BULLETIN BOARD - by J. Kolar - utility to print words. \$15.95

HEBREW ALPHABET - Learn the letters of this alphabet. \$11.95

PRESCHOOL

PRESCHOOL SERIES \$11.95 EA.
Pre. 1 - 2 programs for number recognition and counting
Pre. 2 - 2 programs for simple addition, number game
Pre. 3 - Alphabet recognition.
All 16K E.B. By J. Kolar



FIRST GAMES by Penny Bryan 32K EB. tape \$24.95 disk \$27.95
First Games contains 6 menu-driven programs to delight and teach your early learners (ages 3-6). These games enrich the learning of colors, numbers, lowercase letters, shapes, memory, visual discrimination and counting.



STATES & CAPITALS \$19.95
Multiple choice quiz on a hi-res screen. 32K E.B.

EXPLORERS & SETTLERS \$19.95
Hi-res screen. Multiple choice quiz on explorers and settlers of the new world. 32K

ARROW GAMES by Penny Bryan 32K EB. tape \$21.95 disk \$24.95

Six menu driven games for young children (ages 3-6) to teach directions. All games involve using the arrow keys. Games include LAZYBUG, BUTTERFLY, ARROW MATCH, KALEIDOSCOPE, RABBIT, and OODLE. Colorful graphics.

SOCIAL STUDIES



KNOW YOUR STATES \$19.95 32K
Shows each state to identify on hi-res screen. Help command and scoring. By J. Keeling

THE HISTORY GAME 32K EGB \$14.95
"Jeopardy" type game by James Keeling. 5 categories and 5 questions in each category. One or two player game checks your knowledge of American History. Different questions each round. Hi-res graphics.

FAMOUS AMERICAN WOMEN \$19.95

A who-am-I game of over 50 multiple choice questions on a hi-res screen. 32K E.B.

KING AUTHOR'S TALES \$29.95
Student may create and save original stories on files. Question/Answer, title page, picture features, too. Rewrite, review, and printer features. Includes selection of stories and pictures. 32K EB Disk or 16K EB Tape

Learning*Leisure

TEACHER/STUDENT AIDS

THE QUIZ MAKER by David Stanley
32K E.B. Tape \$24.95 disk \$27.95
A program that enables a teacher to create tests or a student to study for tests in any subject area. Your questions and answers may be saved for future use. Short answer, true-false, fill-in and other quiz formats are supported. Printer option for hard copy test generation. Program randomizes questions, keeps track of score and provides a variety of testing formats.

ARITHMETIC TUTOR DIAGNOSTIC FRACTIONS TUTOR DIAGNOSTIC 32K DISK \$49.95 each

More of the MATH TUTOR SERIES. A diagnostic feature permits teachers to keep records of students' progress on the disk using a password. Printer option generates hard copy of progress reports. ARITHMETIC TUTOR covers multiplication, division, factoring, and order of operations. FRACTIONS TUTOR covers addition, subtraction, multiplication, and division of fractions. Easy to operate. Disk only. By Ed Guy.

COLORGRADE 32KEB \$29.95

A great aid to teachers. Records and calculates grades for up to 6 classes of up to 40 students each. Uses number or letter grades, named or numerical periods and gives a weighted average. Easy to use. Full directions. DISK ONLY. By David Lengel.

COMPUTER LITERACY by Steve Glyn

32K E.B. \$19.95
A computer literacy quiz exclusively for the Color Computer. Tests and scores from over 60 questions on a HI-RES upper and lower case screen. Reviews computer literacy and beginning programming knowledge. Ages 10 and up.

GAMES & ACTIVITIES



TREASURE HUNT by Ari Provost
16K E.B. Tape Only \$19.95
Find your way to the treasure through a maze filled with objects to collect, warriors, thelves, secret passages, dark caves, hidden clues. It's all there for you to enjoy. Includes graphic illustration, animation, various levels of play for ages 6-12. Joystick required



I LOVE MY COCO TEE SHIRT

\$6.95 each + \$1.00 S/H per shirt
Available in Adult Sizes

S, M, L, XL, and Youth L (14-16)

White with Red Trim
and Blue Logo

TREAT YOURSELF OR A FRIEND
TO A GREAT GIFT.
CALL US FOR DETAILS
ON SCHOOL/CLUB ORDERS.



MUSIC



16K SING ALONG WITH SANTA \$7.95 A SPECIAL FOR THE HOLIDAY SEASON!

A happy Santa plays and sings Christmas songs. You sing with him as the words flash across a festive Christmas tree. Choose your favorite song from the menu.

NAME THAT SONG GAMES \$11.95 each

1. 72 children's popular songs. 2 levels of difficulty. Timer. Many hours of fun.
2. 72 all time pop, country, and movie melodies from the last three decades.
3. 60 Broadway Show tunes to test you on past musicals. Fun for all trivia buffs.



The Factory: FROM SUNBURST Strategies in Problem Solving

Grades 4-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learning. Courseware Report Card and Electronic Learning Unique three-level program challenges students to create geometric "products" on a simulated machine assembly line which the student designs.

Diskette for 32K TRS-80 Color Computer with Extended Color BASIC. \$39.95

The Pond: FROM SUNBURST Strategies in Problem Solving

Grades 2-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learning. A small green frog, lost in a pond of lily pads, helps students recognize and articulate patterns, generalize from raw data and think logically.

Diskette for 32K TRS-80 Color Computer with Extended Color BASIC \$39.95

MR. COCOHEAD 16K E.B. \$16.95

Create over 10,000 funny faces. Facial features controlled through keyboard. Surprise command. Ages 4 and up.

LIGHT PEN 16K E.B. \$19.95

Enjoy this interesting piece of hardware. Control screen action with the lightpen. Includes 6 programs.



Dealers Inquiries Invited.



ALL PAYMENTS IN U.S. FUNDS

SEASON'S GREETINGS

(718) 948-2748

Dept. R 227 Hampton Green, Staten Island, N.Y. 10312

Send for catalog with complete descriptions.

Please add \$1.00 per order for postage. N.Y. residents, please add proper tax. FREE set of BINARY DICE, including full directions, with orders of 2 or more items. Authors: We are seeking quality children's software for leisure or learning. Write for details. Top Royalties.

TRS-80 Color Computer. TOPSystem 100.



Continuing The Rainbow Checkbook

By Richard White
Rainbow Contributing Editor

Something bothered me about last month's column. At this point we had code to start a new file, but no way to get the running checkbook balance going. I was able to enter some transactions and scroll up and down through the entries (we will cover the scrolling below), but there sat big, fat zeros in the balance column. Some more thinking about things that happen when a person starts a new file was in order.

First, the best and maybe only time to start a check file is when the checkbook and the last bank statement are fully reconciled. The checkbook balance for the last item cleared by the bank will be different from the bank's reported balance by exactly the net amount of the outstanding transactions that have not yet cleared the bank. That bank balance was entered in Line 2120. Now, if the outstanding items in the checkbook listed prior to the last cleared item were subtracted (checks and charges) or added (deposits or credits), the checkbook balance will not match the program's balance; not until all such outstanding items had been entered. Then the program's balance will match the checkbook's and it will continue to track the checkbook balance from then on. Since we don't start a new file very often there will be no problem as long as the user understands what is happening.

While one cannot be sure the user will understand even if the computer sends a message, the chances of success are 10 times better than if the same message is in the documenta-

tion. Line 2120 and 2125 were changed as below to print the message.

```
2120 CLS:GOSUB50:PRINT:PRINT:PRINT"ENTER LAST
      BANK STATEMENT      BALANCE  ":
      LINEINPUTI$:BB=VAL(I$):PRINT@12B,
      STRING$(64,32):PRINT@12B,"note: REPORTED
      CHECKBOOK          BALANCE WILL NOT MATCH
      YOUR      BALANCE UNTIL OUTSTANDING"
2125 PRINT"CHECKS, CHARGES, DEPOSITS
      AND CREDITS AT STATEMENT TIME
      ARE ENTERED,";GOSUB1:CB=BB:
      GOSUB52:GOSUB54:GOSUB56:PRINT@12B,
      STRING$(192,32)
```

After the text, there is a *GOSUB1* to the *INKEY\$* with cursor routine to allow the user to read the message and press a key to continue. The bank balance is moved into the variable CB, the checkbook balance. Subroutines 52, 54, and 56 print the permanent input screen messages as discussed last month. The other key changes occur in Line 60 through 66.

```
60 GOSUB22:GOSUB30:GOSUB36:GOSUB40:RETURN
62 GOSUB26:GOSUB30:GOSUB36:GOSUB40:RETURN
64 GOSUB28:GOSUB30:GOSUB36:GOSUB40:RETURN
66 I$=CHR$(13):GOSUB22:FG=1:GOSUB30:GOSUB36:
      FG=B:GOSUB40:RETURN
```

(Richard White has a long background with micro-computers and specializes in BASIC programming. With Don Dollberg, he is the author of the TMS database management program.)

The only change in these lines is to call subroutine 36 rather than 37. Line 36 calculates a new checkbook balance and falls to 37 where it is printed. Now the checkbook balance printout was tested for the first time and a bug was found. The print locations for the checkbook balance were one space too far right. The corrected lines are shown below. If you have typed these in already, change the *PRINT@120* in 11 to 119 and 248 in 15 to 247.

```
11 PRINT@96,USING$4$;LC$;:PRINT"LD$;
PRINT@108,USING$5$;LA:PRINT@119,USING$5$;LB;:
PRINTSTRING$(63,32);PRINT@128,USING$N$;LS$;:
PRINTLN$:RETURN
15 PRINT@224,USING$4$;CC$;:PRINT"CD$;
PRINT@236,USING$5$;CA:PRINT@247,USING$5$;CB;:
PRINTSTRING$(63,32);PRINT@258,USING$N$;CS$;:
PRINTCN$:RETURN
```

To review and edit data, we need to be able to scroll back and forth through the database using the arrow keys. The program needs to look at the key entry at the beginning of each new entry and enter scroll mode if it sees an up arrow. This also puts the program in the scroll mode preventing access to data entry routines. This is accomplished in Line 2150.

```
2150 I=INSTR(1,"DAVES"+CHR$(94)+CHR$(10),1$);
IFFG=0THENON1 GOSUB62,64,66,200,900,60,10
ELSEON1 GOSUB2160,2160,2160,200,900,17,10
```

The keystroke in 1\$ is checked by the *INSTR* statement. If the keystroke is an up arrow, *CHR\$(94)*, *I* is set to 6. *INSTR* starts in the string *DAVES* looking for a match and then goes to the arrow codes, counting as it goes. When it finds a match it returns the character count up the string or 0 if there is no match. If the program is in the data entry mode, *FG=0* and the *ON I GOSUB* after the *THEN* is used. If the program is in scroll mode, *FG=1* and control goes to the *ON I GOSUB* after the *ELSE*. In this *ON I GOSUB* the first three calls are Line 2160 denying access to the data entry mode. If *FG=0*, an up arrow calls Line 68, otherwise Line 17 is called.

```
68 PRINT@320,"REVIEW ENTRIES"      ";PO=335:
FG=1:GOSUB17:RETURN
```

This sets up the scroll mode by printing *REVIEW ENTRIES*, setting *PO=335* to put the cursor on the same line and setting *FG=1*. Then Line 17 is called. We will be dealing extensively with the variables in the table following Line 17, so give it a quick once over and be ready to come back to it if you need to keep things straight.

```
17 IFCR>1THENCRCR=CR-1:GOSUB14:GOSUB12:GOSUB11:
RETURNELSERETURN
```

VARIABLE LISTING

PURPOSE	CURRENT	LAST
Check #	CC\$	LC\$
Date	CD\$	LD\$
Amount	CA	LA
Balance	CB	LB
Status	CS\$	LS\$ Cleared or Outstanding
Note	CN\$	LN\$
Current Record Number	CR	
Next Record to Enter	LR	
Last Bank Balance	BB	

CR is the count of the current record, the lower of two displayed. As long as CR is greater than one, there is a previous record to display as the current record, so CR is reduced by one. Then the program goes to three subroutines which reprint the record portion only on the screen.

```
14 CC$=LC$:CD$=LD$:CA=LA:CB=LB:CS$=LS$:CN$=LN$
```

Current record variables start 'C' while those for the previous record are 'L' for last variables. Since we want to make the previous record into the current (bottom) one on the string, the first task is to move the data in the L-variables to the C-variables. This Line 14 does. We wrote earlier about Line 15, which prints the current record data as the bottom entry on the screen. The program falls from Line 14 to 15 and the printing is done. Line 15 carries the *RETURN*.

Now things get complicated. In Line 38, we put some of the data for a record into a single string with each field like check number, date, status and note separated by a dollar sign. What else in a program about money? Here is how a string might look: *AS(22) = "0123\$08/22/84\$0\$RAIN-BOW SUBSCRIPTION"*. Now we need to take the string apart to recover that data.

```
2 F=INSTR(F1,A$(V),"$"):RETURN
```

Our tool will be the *INSTR* statement in Line 2 above. We will use it over and over. We want to get data from the record in string *AS(V)* starting at character position *F1* and going to the position just before the next '\$'. In Line 2, we find the position of the '\$' in variable *F* and *RETURN* to the calling routine to get the specific data. For the scroll backward routine, Line 2 is called by Line 12 which gets the data from the string.

```
12 F1=1:V=CR-1:GOSUB2:LC$=NID$(A$(V),F1,F-F1):
F1=F+1:GOSUB2:LD$=NID$(A$(V),F1,F-F1):
LS$=NID$(A$(V),F+1,1):LN$=NID$(A$(V),F+3,
LEN(A$(V))-F+3):LA=A(V,0):LB=A(V,1):RETURN
```

First, *F1* is set to one to start things at the beginning of *AS(V)*. Next *V* is assigned the value *CR-1* since we are looking for the record before the current one. Next, subroutine 2 is called to get *F*. Now we can recover the last check

number into *LC\$* as a string. In *MID\$(A\$(V),F1,F-F1)*, start at position *F1* and get a string *F-F1* characters long from string *A\$(V)*. Now that wasn't too bad. If it works once it should work again to get a date into *LD\$*. Set *F1* to *F+1*, the string position after the "S" and *GOSUB 2*. The *MID\$* code to fill *LD\$* is identical to what we used before, but the values in *F1* and *F* are different. Note, just past the "S" at *F* is a one-character status indicator, so we don't have to *GOSUB 2*. In the *MID\$* for *LS\$* starting at *F+1* and getting one character does the job. After the status character is a "S" and then the note which goes to the end of the string. So the start point must be *F+3*. The length of the note will be *LEN(A\$(V))* less the start position *F+3*. So, these are used in another *MID\$* to get the note into *LN\$*. The amount and the balance are in an array so they are easily obtained using *LA = A(V,0)* and *LB = A(V,1)*.

Even the most complicated code is nothing more than a series of small pieces. In fact, the logic to put that piece together was tougher than writing the code itself. All that remains is to print the last record data at the top of the screen which subroutine 11, discussed earlier, does.

```
18 IFCR<LR-1 THEN CR=CR+1:GOSUB10:GOSUB16:GOSUB15:
RETURNELSEGOSUB40:RETURN
```

Scrolling forward is nearly the same as scrolling backward. However, we do need to do a few things as we come to the end of the file. In Line 18, we first test if the current record is the one before the value in *LR*. *LR* carries the number of the next record to be entered so there is no data in that record yet. If *CR<LR-1* is true, add one to *CR* and rewrite the screen with a new current and previous record. Try following subroutines 10, 16 and 15 yourself. If *CR<LR-1* is false, *CR* must equal *LR-1* and the program is sent to 40 to prepare the screen for data entry. Line 10 was discussed earlier here. Lines 15 and 16 are shown below.

```
15 PRINT@224,USINGS4$:CC$:PRINT"
"CD$:PRINT@236,USINGSS$:CA:PRINT@248,USINGSS$:
LB$:PRINTSTRING$(63,32):PRINT@256,USINGSN$:
CS$:PRINTCN$:RETURN
16 F1=1:V=CR:GOSUB2:CC$=MID$(A$(V),F1,F-F1):
F1=F+1:GOSUB2:CD$=MID$(A$(V),F1,F-F1):
CS$=MID$(A$(V),F+1,1):CN$=MID$(A$(V),F+3,
LEN(A$(V))-F+3):CA=A(V,0):CB=A(V,1):RETURN
```

Next month, we need to deal with the other way to get records into the program, that is loading a tape or disk file. To put things in proper order, there needs to be a file to load. So we need to write the code to save the file. This establishes the file form and the input code exactly reflects this form. There also needs to be some housekeeping and we might as well write for both tape and disk files. A tape user will be able to run the program since it will never see Disk BASIC code when loading and saving to tape. Later, a tape user can upgrade to disk and be up and running immediately. This also allows archiving files to tape from a disk system. However, at \$2.50 a disk, disk storage is about as cost effective as tape storage and much more convenient. Finally, since hard copy from a printer is really a way of saving data, we will put the printer choice on the Save menu.

The listing:

```
2 F=INSTR(F1,A$(V),"$"):RETURN
```

```
11 PRINT@96,USINGS4$:LC$:PRINT"
"LD$:PRINT@108,USINGSS$:LA:PRIN
T@119,USINGSS$:LB$:PRINTSTRING$(
63,32):PRINT@128,USINGSN$:LS$:
PRINTLN$:RETURN
12 F1=1:V=CR-1:GOSUB2:LC$=MID$(A
$(V),F1,F-F1):F1=F+1:GOSUB2:LD$=
MID$(A$(V),F1,F-F1):LS$=MID$(A$(
V),F+1,1):LN$=MID$(A$(V),F+3,LEN
(A$(V))-F+3):LA=A(V,0):LB=A(V,1)
:RETURN
14 CC$=LC$:CO$=LO$:CA=LA:CB=LB:C
S$=LS$:CN$=LN$
15 PRINT@224,USINGS4$:CC$:PRINT
"CO$:PRINT@236,USINGSS$:CA:PRIN
T@248,USINGSS$:LB$:PRINTSTRING$(
63,32):PRINT@256,USINGSN$:CS$:
PRINTCN$:RETURN
16 F1=1:V=CR:GOSUB2:CC$=MID$(A$(
V),F1,F-F1):F1=F+1:GOSUB2:CD$=MI
D$(A$(V),F1,F-F1):CS$=MID$(A$(V)
,F+1,1):CN$=MID$(A$(V),F+3,LEN(A
$(V))-F+3):CA=A(V,0):CB=A(V,1):R
ETURN
17 IFCR>1 THEN CR=CR-1:GOSUB14:GOS
UB12:GOSUB11:RETURNELSERETURN
18 IFCR<LR-1 THEN CR=CR+1:GOSUB10:
GOSUB16:GOSUB15:RETURNELSEGOSUB4
0:RETURN
60 GOSUB22:GOSUB30:GOSUB36:GOSUB
40:RETURN
62 GOSUB26:GOSUB30:GOSUB36:GOSUB
40:RETURN
64 GOSUB28:GOSUB30:GOSUB36:GOSUB
40:RETURN
66 I$=CHR$(13):GOSUB22:FG=1:GOSU
B30:GOSUB36:FG=0:GOSUB40:RETURN
68 PRINT@320,"REVIEW ENTRIES
":PO=335:FG=1:GOSUB17:RETUR
N
2120 CLS:GOSUB50:PRINT:PRINT:PRI
NT"ENTER LAST BANK STATEMENT
BALANCE ":LINEINPUTI$:BB=VA
L(I$):PRINT@128,STRING$(64,32):P
RINT@128,"note: REPORTED CHECKS
OOK BALANCE WILL NOT MATCH
YOUR BALANCE UNTIL OUTSTAND
ING"
2125 PRINT"CHECKS, CHARGES, DEPO
SITS AND CREDITS AT STATEMENT
TIME ARE ENTERED.":GOSUB1:CB=
BB:GOSUB52:GOSUB54:GOSUB56:PRINT
@128,STRING$(192,32)
2150 I=INSTR(1,"DAVES"+CHR$(94)+
CHR$(10),I$):IFFG=0 THEN ON I GOSUB
62,64,66,200,900,68,18ELSE ON I G
OSUB2160,2160,2160,200,900,17,18
```


Custom Software Engineering, Inc.

807 Minutemen Causeway (D-2), Cocoa Beach, Florida 32931

(305) 783-1083 For information or technical support, please call between 5:30 and 8:30 P.M. Eastern time

DATE-O-BASE CALENDAR

Puts YOU in charge of your schedule!

- Graphically displays any monthly calendar between 1700 and 2099. You put in up to twelve 28 character memos per day... calendar shows where the memos are... call up of day shows details.
- Search capability allows you to list or print all memos between two specified dates or only ones meeting key-word criteria.
- Date computation shows elapsed time between two dates in days, weeks, months and years.
- Requires 32K in BASIC

TAPE DATE-O-BASE CALENDAR - \$16.95 (max. 400 memos/tape file)

DISK DATE-O-BASE CALENDAR - \$19.95 (over 4000 memos/disk... max. 300 memos/month)

DISK DATA HANDLER - 64K

Provides the growth capability needed for your increasingly sophisticated applications.

- Allows you to design disk data files for your specific needs. You define a basic record of up to 14 fields and 246 characters.
- Provides fast selection and sorting based on any field or combination of fields in this world.
- User defined output of reports to screen, printer, or disk files which may be read by your BASIC programs for any computational or special formatting requirements.

\$54.95 in BASIC with Machine Language subroutines.

That's INTEREST-ing

Let your computer do some REAL computation!

- Helps you solve problems dealing with time, money, and INTEREST!
- Amortization tables any way YOU want them... even lets you change any terms mid-schedule!
- Calculates Present Value, Future Value, Capital Recovery for any combination of payments you specify.
- Rate of Return computation predicts how hard your money will be working for you!
- Computes Bond yields... current and to redemption.
- All answers available on screen or printer.

\$29.95 in BASIC

MATH TUTOR

5 programs in 1

- Step by step approach... error correction.
- Goes from basic fact drill (+, -, x, /) to full addition, subtraction, multiplication, division.
- Four levels of difficulty.

\$13.95 in BASIC

★★★★★★★★

SPELLING TEACHER

Teaches YOUR word lists... suitable for any level from kindergarten to college!

- Words presented in FOUR different modes... study, scrambled word game, trial test, and final test.
- Misspelled words are retaught to reinforce correct spelling.

■ Tape of disk files also up to 300 words

\$12.95 in BASIC

DISK DOUBLE ENTRY

If you have spent hours trying to balance your Debits and Credits, this program is for you!

- Designed for small business, club and personal use.
- Enter transactions in a journal type format. Program will maintain current account balances, produce Trial Balance, Income, and Balance Sheet reports and complete Account Ledgers.
- Will handle up to 300 accounts including report headings and totals.
- Up to 1400 average transactions on a diskette.
- Summary reports and four levels of subtotals available.
- Requires 32K and an understanding of standard double entry accounting concepts.

\$44.95 in BASIC with Machine Language subroutines.

★★★★★★★★

STATEMENT WRITER

For use with (and requires) Disk Double Entry

- Produces statements suitable for billing from your Receivables accounts.
- Provides mailing labels to use with your statements and account summaries.

■ Designed and formatted to allow you to change formats to accommodate your own special needs.

\$34.95

COMMAND STREAM PROCESSOR

Powerful, versatile utility adds a new dimension to your Color Computer.

- A program to run your other programs!
- Will allow you to prepackage a stream of direct system commands as well as INPUT and LINE INPUT to your BASIC program. This results in a totally automated stream of activity.
- If you understand your computer and the flow of activity required for your total operation, you are ready for the power of COMMAND STREAM PROCESSOR!

\$19.95 Completely relocatable... Machine Language

GRAPHIC SCREEN PRINT PROGRAM

Works in all PMODES and lets you shift screen image anywhere on the printed page.

- Relocatable code lets you use all of your 16K or 32K machine.
- Available for Color Basic 1.0 and 1.1/1.2. Use EXEC 41175 to see which you have and SPECIFY WITH ORDER.

■ SPECIFY PRINTER TYPE... in Machine Language

\$7.95 - TRS-80* LP-VII/VIII & DMP 100/200/400/420

\$9.95 - Epson GRAFTRAX*, NEC* PC 8023 A/C, IDS 440/445, Paper Tiger* 460/560, Micro Prism* 480, Prism* 80/132 (with dot plotting), TRS-80* DMP-120, TDP-1, PROWRITER* Centronics 739, Micro-line* 82A/83A (with Okigraph 1) /84/92/93, Star Micronics, Inc. GEMINI 10/10X/15 and Gorilla Banana.

(Trademarks of Tandy Corp., Epson America, Inc., C-Itoh, NEC America, Okidata Corp., Integral Data Systems, Inc.)

★★★★★★★★

ALPHA-DRAW

Works great with GRAPHIC SCREEN PRINT PROGRAM!

- Subroutine designed to let you add any keyboard character to your graphic displays.
- You define X and Y coordinates and a string variable of one or more characters... ALPHA-DRAW does the rest!
- BONUS - Includes instructions for a true line-numbered merge of tape files.

\$8.95 in BASIC



**RAINBOW
CERTIFICATION
SEAL**
ALL LISTED
PROGRAMS

ALL PROGRAMS require Extended Color Basic and are delivered on cassette. All, except Tape Date-O-Base Calendar, are DISK System compatible.

U.S. and CANADA add \$1.00 per order for shipping. Overseas \$2.50 per order. All prices in U.S. dollars. Florida residents add 5% sales tax. Return within two weeks if not completely satisfied.



For VISA and Master Card orders:
Include type, account number, expiration date, signature and phone number.
Sorry! No COD's.



Force A Cold Start From Reset With This Simple Project

By **Tony DiStefano**
Rainbow Contributing Editor

Does this ever happen to you? You are playing a nice game, or heavy into some database. Then, you get tired and want to quit. So, you hit the Reset button in hopes of clearing what is in memory, and the software appears on the screen again. So you hit the Reset button again in disbelief but to no avail, it comes right back. There is no way of getting out of it. You then proceed to a power down routine. First you open the doors to all your drives, to avoid destroying a disk. Then you turn the computer off. Count to 15 and then turn the computer back on. Next you close the doors to the drives in use. It happens to me all the time, especially when I use protected software. Well, I decided to do something about it.

Before I get into the construction part of this article, a little theory on what is happening. When someone first turns on the computer, it does what I call "a cold start routine." It does things like check how much memory is present and

initializes the PIA and SAM chips. It then initializes all the necessary pointers, etc. Before it turns control over to the user by putting the OK prompt on the screen, it puts the value \$55 (\$ denotes a Hex number) or 85 in decimal in location \$71, 113 in decimal. But first it checks to see if it has been on before (if it has done this initializing routine before). It does this by seeing if memory location \$71 or 113 in decimal contains \$55 or 85 in decimal. If it does, it means the computer has already been on before the Reset button was pressed and that it does not have to do a cold start. Instead, it does a warm start. This warm start first initializes the PIAs and SAM chips only and then jumps to the warm start vector. The warm start vector is located in memory locations \$72 and \$73, 114 and 115 in decimal.

You can see that if you were to change the reset vector to your own program, and made sure that \$71 contained \$55, then, if someone were to press the Reset button, control of the computer would not return to the user's program, but rather the program pointed to by the reset vector. This is how a program can come back after you press the Reset. NOP is the first byte to which the reset vector must point. That is \$12, 18 in

decimal. That is another condition of a warm start. The BASIC ROM checks for that.

Now that we know what the computer does when we hit the Reset button, how do we change these conditions to suit our own needs? Well, it's simple, in theory anyway. What if we were to deny the CPU access to that particular byte (\$71)? If the computer could not read or write to that byte, then when it made its test, it would never see \$55 and always do a cold start. So much for theory, this is the real world. The makers of the Color Computer were kind (or smart) enough to put a "MEMORY DISABLE" or better known as the SLEND pin, on the 40-pin bus connector. This pin is normally high (five volts), and when some device or other pulls it low (0 volts), all forms of memory chips (ROM, RAM and PIAs) are disabled. I will be using this pin in conjunction with my circuit to deny access to memory location \$71 to the CPU.

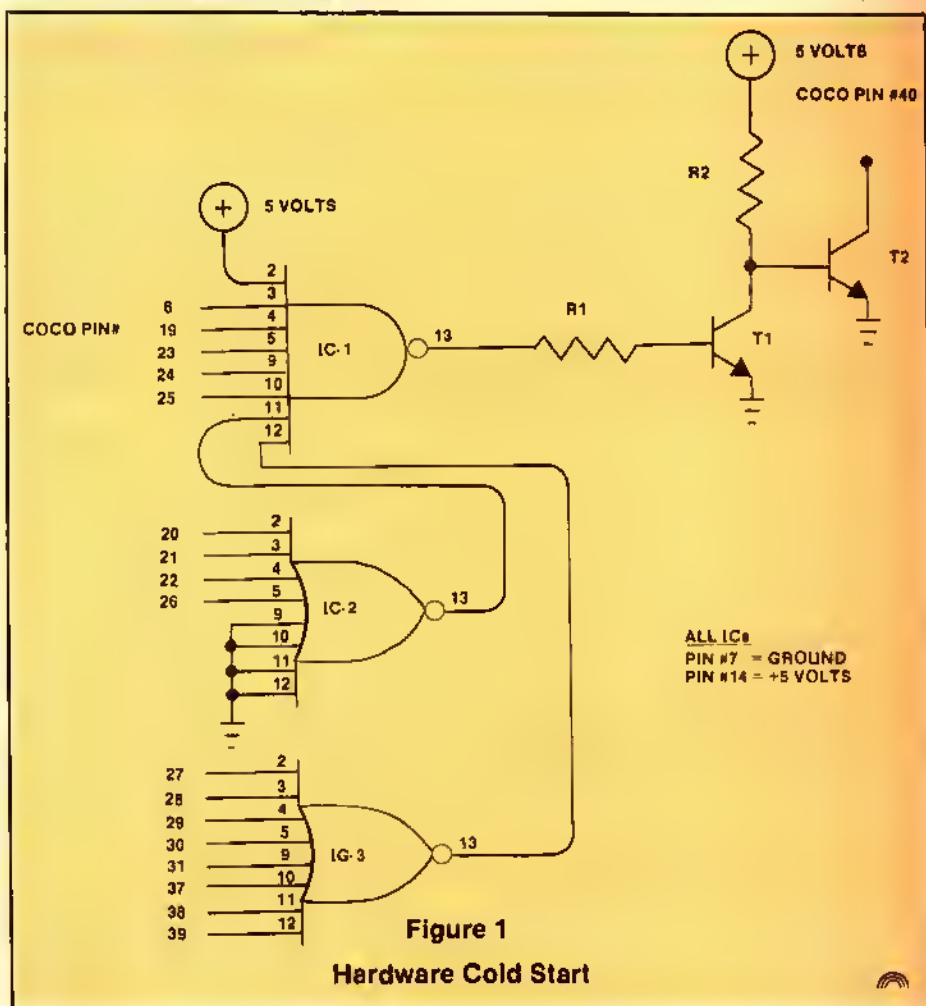
The actual circuit is in Figure 1 and the parts list is in Table I. Some of these parts are not available at your local Radio Shack. You will have to go to a more specialized electronic store or to a mail order store like Active Electronics or JDR Electronics. You can get a com-

(Tony DiStefano is well known as an early specialist in Color Computer hardware projects. He is one of the acknowledged experts on the "insides" of CoCo.)

Forcing a cold start is now quite easy. Hold down the switch with one hand. Hit and release the Reset button with the other. When the computer returns to power on condition, release the switch, it's as easy as that. Any time you don't

NOTE: There is an error in last month's "Halt Pin And Its Functions" schematic. Pin #8 should read Pin #6 and a Pin #8 go ground should be added.

Quantity	ID #	Description	RS Part#
1	IC-1	CD4068	N/A
2	IC-2,3	CD4078	N/A
1	R-1	1000 OHMS 1/4W	271-1321
1	R-2	100 OHMS 1/4W	271-1311
2	T-1,2	MPS3904 or MPS222A	276-2016 276-2009
3	C-1,2,3	1 uF CAPACITOR	272-1053
3	-	14 PIN SOCKETS	276-1999
1	-	PROTO-BOARD	N/A

[illegible]

Home Financial Management Made *Ea\$ier*

By Edward W. Carson

Personal Savings is a program that should prove very helpful in your home financial management. The menu gives four financial areas to choose from: LOANS, SAVINGS, PRESENT VALUE, FUTURE VALUE, and the LOANS and SAVINGS sections of the menu are mostly self-explanatory.

(Edward Carson is a senior majoring in finance at Ohio State University.)

The only thing not explained in the documentation is, if you would like to determine the amount of a loan (given a certain monthly payment), simply do not enter a number when asked what the amount of the loan is. *Personal Savings* will compute the amount of the loan by asking the monthly payment.

Following are some explanations that may prove helpful.

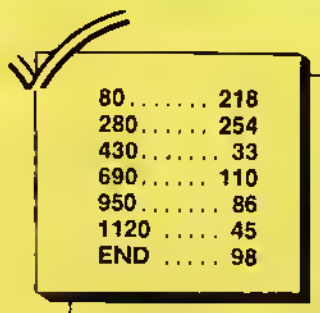
Present value: Today's value of some future return. Government bonds are

sold at a discount according to their present value.

Example: With a current interest rate of 10 percent, a \$1,000 bond which matures one year from today would be worth \$900 today.

Future value: Value of an investment at some point in the future.

Example: \$100 invested today at 10 percent interest will be worth \$110 one year from today.



80.....	218
280.....	254
430.....	33
690.....	110
950.....	86
1120.....	45
END.....	98

The listing:

```
1 FORX=1022T01335
2 POKEY,195
3 NEXTX
4 FORX=1336T01535
5 POKEY,195
6 NEXTX
```

```
7 PRINT@160,"PERSONAL SAVINGS"
8 FOR Y=1208T01215
9 POKEY,195:NEXTY
10 PRINT@238,"BY"
11 FORD=1264T01279
12 POKED,195
13 NEXTD
14 PRINT@328,"EDWARD W. CARSON"
15 FORT=1368T01375
16 POKET,195
17 NEXTT
20 FORS=1T0700:G=G:NEXTS
30 CLS:FORX=1022T01119
31 POKEY,195
32 NEXTX
40 FORX=1440T01600
41 POKEY,195
42 NEXTX
```




PRICKLY-PEAR SOFTWARE

QUALITY PROGRAMS FOR YOUR COCO & TDP-100

PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.

ALL NEW!!! 32K VIKING II — The most popular simulation of all time was **VIKING I**, by Bill Nolan, and now here is the long awaited **VIKING II**. This great program, by the original author, is twice as long and lots more fun. See if you have what it takes to become King or Queen in ancient Norway, and along the way, see why **VIKING I** clubs were formed all over the USA to play the first **VIKING I**. Tape • \$24.95 Disk \$29.95

ADVENTURE IN WONDERLAND — This 32K machine language adventure was THE most popular program for five months. If you don't have it, you have missed the best adventure experience available on your computer. Tape • \$24.95 Disk • \$29.95

COLORDISK TRIVIA — A great game for 1 to 4 players, this game has been a sensation since it was introduced. It became our #1 program in less than a week, and for good reason. This trivia game has 1100 questions in 5 categories — a FULL disk. It is really fun and challenging to play, and you can develop your own question disks easily with the included software. This program is already in use in many schools, but if you just like trivia, you will be interested to know that we have additional question disks available with 1100 questions on each one. We have a disk of Bible questions, sports questions, entertainment questions, and questions for children (8-15). The game, with 1100 questions and the question development program is \$29.95. The additional question disks are \$19.95 each.

GRAVITOR — A new machine language arcade game for the Coco that needs only 16K of RAM, and yet gives you 16 levels of play, 10 high-res playing screens in color, multiple voice music, and a practice mode. Fly from planet to planet (each one different), and see if you can destroy the enemy bases, or challenge the twisting passage to the reactor on the death base. No joysticks needed. **AWESOME!!** Tape • \$24.95 Disk • \$29.95

THE COMPLETE ENCHANTER — A 100% GRAPHICS ADVENTURE with a ton of rooms and lots of options. Can you fight your way in and defeat the dungeon lord Asmodeus? Even the fights are in high-res graphics. Needs 32K. Tape \$24.95 Disk • \$29.95

BONANZA PACK FOR FANTASY GAMERS — Bill Nolan, the author of the Dragon's Byte column, brings you over 100K of fantasy gaming programs on a single disk. These are not games. They are useful computer programs for anyone who plays fantasy games. With instructions. 32K disk only. \$29.95

COLORKIT — This program has been in our top five for over a year. It is the ultimate programmer's utility, giving you a full screen editor, keyclick, 35 new commands, programmable keys, and lots more. There are other programmer's utilities on the market, but all are sad imitations of the original **COLORKIT**. You know what they say — "Accept no substitutes." Tape \$34.95 Disk \$39.95

STATISTICS — STATISTICS — STATISTICS — STATISTICS — STATISTICS — STATISTICS — STATISTICS

LIZPAC — If you have a need to do statistical analysis, this is the program you have been waiting for. The only statistics package that comes close needs \$3,000 worth of computer to run, costs \$1995 for the software, and this one is better! **LIZPAC** is 850K of programming, filling 7 disks, and comes with a manual that is nearly 200 8 1/2 by 11 pages long in a quality binder. It will do anything you need to do in statistics (including graphic display). In its manual, the list of features and functions is **FIVE PAGES** long, while the list of included programs is **THREE PAGES** long. Call for specific information. The package is friendly to use, and requires no specialized computer knowledge. 32K disk - \$195.00

FLIGHT PLAN — FLIGHT PLAN — FLIGHT PLAN — FLIGHT PLAN — FLIGHT PLAN — FLIGHT PLAN

AIRNAV — A COMPLETE PROFESSIONAL FLIGHT PLANNER — **AIRNAV** is powerful and user friendly disk based flight planner for your Color Computer. This package was developed by a Commercial Airline pilot, and was checked against his airline's official flight plans for accuracy. In two minutes this program will produce a flight plan on your screen or printer that would take two hours to duplicate.

The disk for **AIRNAV** is packed with information on over 1,400 VOR stations or nav aids, and over 1,000 airports within the continental United States and Hawaii, including civilian airports, Air Force, and Navy bases. You can easily add nav aids and airports if you wish, and you can delete or modify the information to keep it up to date. You can also save your 10 most used routes. This quality program is for disk systems only, and is shipped with full documentation in a quality binder. If you fly, you need **AIRNAV**. \$99.95

1-800-223-5369 EXTENSION 256

Send for our free Catalog of 50 Great Programs for your CoCo

POLICY ON PROTECTION

We believe our customers are honest — all of our software can be backed up using standard backup procedures.

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1 (403) 421-8003

Stocked by Quality Dealers, or

Send Order To: **PRICKLY-PEAR SOFTWARE**

8532 E. 24th Street
Tucson, Arizona 85710
(602) 886-1505



Your Personal check is welcome - no delay. Include \$1.50 shipping for each program ordered. (Shipping free on \$50.00 or larger orders). AZ residents add 7% sales tax. Orders shipped within two days.

```

50 PRINT@135,"1) PRESENT VALUE"
60 PRINT@199,"2) FUTURE VALUE"
70 PRINT@263,"3) LOAN PAYMENT"
80 PRINT@327,"4) SAVINGS"
89 GOTO90
90 INPUTA: IFA>400TO50
91 IFA=200TO190
92 IFA=300TO780
93 IFA=400TO380
94 IFA=100TO1000
100 FORX=1376TO1407:POKEX,220:NE
    TX
101 PRINT@448,"TO RETURN TO MENU
    PRESS enter"
102 INPUTQ$
110 Q$="INKEY$":IF"INKEY$"="<ENT
    ER">GOTO50
120 OOT030
190 CLS:PRINT@65,"  FUTURE VALUE
    OF A DOLLAR"
200 FORO=1120TO1151:POKEO,220:NE
    XO
210 PRINT@160,"HOW MUCH MONEY IS
    INVESTED":INPUTM
220 PRINT"HOW MANY YEARS":INPUTN
230 PRINT"WHAT IS THE INTEREST R
    ATE":INPUTI
240 IF I<100TO360
250 PRINT"HOW MANY TIMES PER YEA
    R":PRINT"IS THE INTEREST COMPOUN
    DED":INPUTY
260 I8=I/Y:N=N*Y:I8=I8/100
270 C=1+I8
280 C=C^N
290 FV=C*M
300 N=N/Y
310 CLS:PRINT@98,"DOLLARS INVEST
    ED":PRINT@116,USING"#####",M
320 PRINT@162,"INTEREST RATE":PR
    INT@186,I;:PRINT" %"
330 PRINT@226,"NUMBER OF YEARS":
    PRINT@250,N

```

```

340 PRINT@290,"FUTURE VALUE":PRI
    NT@309,USING"#####.##";FV
350 GOTO100
360 CLS:PRINT@228,"PLEASE STATE
    INTEREST RATE      AS A VALUE GR
    EATER THAN ONE":INPUTI
370 GOTO250
380 CLS:PRINT@65,"SAVINGS"
390 FORX=1120TO1151:POKEX,220:NE
    TX
400 PRINT@160,"PLEASE CHOOSE"
410 PRINT:PRINT"1) HOW MUCH TO R
    EGULARLY SAVE":PRINTTAB(4)"TO RE
    ACH GIVEN GOAL"
420 PRINT:PRINT"2) WITH REGULAR
    SAVINGS OF":PRINTTAB(4)"X DOLLAR
    S HOW MUCH CAN" :PRINTTAB(4)"BE
    SAVED WITHIN A":PRINTTAB(4)"SPEC
    IFIC TIME PERIOD" :INPUTPP: GOTO
    720
430 CLS:PRINT:PRINT"WILL SAVINGS
    BE IN MONTHLY(M)":PRINT"OR WEEK
    LY(W) INCREMENTS":INPUTL$
440 IFL$="M"GOTO730
450 IFL$="W"GOTO740
460 PRINT:PRINT"HOW MANY ";L$:IN
    PUTY
470 IF PP=1 GOTO510
480 PRINT:PRINT"HOW MUCH WILL YO
    U SAVE":PRINT"EACH MONTH (WEEK)"
490 INPUTA
500 GOTO520
510 PRINT:PRINT"WHAT IS YOUR SAV
    INGS GOAL":INPUTM
520 PRINT:PRINT"WHAT IS THE INTE
    REST RATE":INPUTI
530 IF I<100TO690
540 I=I/N:I=I/100
550 N=N*Y
560 C=(1+I)^Y:C=C-1
570 R=C/I
580 IF PP=1 OOT0610
590 M=A*R
600 GOTO620
610 A=M/R
620 I=I*100:N=N/Y:I=I*N
630 CLS:PRINT@99,"TOTAL SAVINGS"
    :PRINT@117,USING"#####.##";M
640 PRINT@163,L$:PRINT@170,"TO S
    AVE":PRINT@185,Y
650 PRINT@227,"INTEREST RATE":PR
    INT@249,I;:PRINT" %"
660 OOT0750
670 PRINT@291,L$:PRINT@300,"SAVI
    NGS":PRINT@312,USING"#####.##";A
680 OOT0100
690 CLS:PRINT@228,"PLEASE STATE
    INTEREST RATE":PRINT@260,"AS A V

```

SO. CALIFORNIA SHINES



RESIDENTS & VISITORS—WE ARE THE
COLOR COMPUTER SPECIALISTS IN
LOS ANGELES. SOFTWARE,
MODEMS, BOOKS, PRINTERS,
MONITORS, ACCESSORIES

POLYGON CO.

1316 Wilshire Blvd. • Suite 206 • Los Angeles, CA 90017
(213) 483-8388


```

ALUE GREATER THAN ONE" :INPUT I
700 GOTO 540
710 INPUT P
720 GOTO 430
730 L$="MONTHS":N=12:GOTO 460
740 L$="WEEKS":N=52:GOTO 460
750 IFL$="WEEKS" THEN L$="WEEKLY"
760 IFL$="MONTHS" THEN L$="MONTHLY"
"
770 GOTO 670
780 CLS:PRINT@68,"LOAN PAYMENTS"
790 FOR X=1120 TO 1151:POKEX,220:NE
XTX
800 PRINT@160,"HOW MUCH IS LOAN
FOR":INPUT P
810 PRINT:PRINT"HOW MANY MONTHS"
:INPUT M
820 PRINT:PRINT"WHAT IS THE INTE
REST RATE":INPUT K
830 IF K<1 GOTO 960
840 K=K/12:K=K/100
850 C=(1+K)^M:C=C-1
860 O=(K+1)^M:O=O*K
870 C=C/O
880 IF PV=0 GOTO 980
890 A=P/C
900 K=K*12:K=K*100
910 CLS:PRINT@98,"AMOUNT OF THE
LOAN":PRINT@119,USING"#####,";
PV
920 PRINT@162,"NO. OF MONTHS":PR
INT@186,M
930 PRINT@226,"INTEREST RATE":PR
INT@248,K;" %"
940 PRINT@290,"MONTHLY PAYMENTS"
:PRINT@311,USING"#####.##";A
950 GOTO 100
960 CLS:PRINT@228,"PLEASE STATE
INTEREST RATE AS A VALUE GR
EATER THAN ONE":INPUT K
970 GOTO 840
980 PRINT:PRINT"WHAT ARE THE MON
THLY PAYMENTS":INPUT A
990 PV=A*C:GOTO 900
1000 CLS:PRINT@65,"PRESENT VALUE
OF A DOLLAR"
1010 FORT=1120 TO 1151:POKET,220:N
EXTT
1020 PRINT@160,"WHAT IS THE FU
TURE RETURN EXPECTED":INPU
T R
1030 PRINT:PRINT"WHAT IS THE
INTEREST RATE":INPUT I
1040 PRINT:PRINT"HOW MANY YEAR
S BEFORE THE RETURN IS EX
PECTED":INPUT Y
1050 IF I<1 GOTO 1170
1060 I=I/100
1070 C=(1+I)^Y

```

```

1080 C=1/C:P=P/C
1090 I=I*100
1100 CLS:PRINT@66,"EXPECTED"
1110 PRINT@98,"FUTURE RETURN":PR
INT@117,USING"#####,";R
1120 PRINT@162,"INTEREST RATE":P
RINT@186,I;" %"
1140 PRINT@226,"YEARS TO MATURIT
Y":PRINT@250,Y
1150 PRINT@290,"PRESENT VALUE":P
RINT@309,USING"#####.##";PV
1160 GOTO 100
1170 CLS:PRINT@228,"PLEASE STATE
INTEREST RATE AS A VALUE G
REATER THAN ONE":INPUT I
1180 GOTO 1060
1190 PRINT@384,STRING$(32,"*")
1200 PRINT@421,"DO YOU WISH TO"
1210 PRINT@453,"CONTINUE (Y OR N
)"
1220 INPUT Q$
1230 K=I-M-N-I8=A-PV=C-O-R=0
"
1240 IF Q$="Y" GOTO 10
1250 IF Q$="N" GOTO 1270
1260 GOTO 1190
1270 CLS(3):END
1480 *12

```

★★★ NEW ★★★

Formaker 2.0

the fastest, most complete
office package yet!

Totally Menu Driven
Customize with company information & printer
Complete "on screen" instructions

FORMS

letter
invoice
quote
purchase order
mail order
confirm order
receipt

STORES

complete forms
item list
subquotes
letters
footnotes
customer info

FIGURES

quantity
list
net
discount
subtotals
tax
freight, etc.

SEPARATE CONFIGURE PROGRAM

for company info
printer options
quote & inv. #
w/auto sequencing
auto date

PRINTS

form feed
letterhead
envelope
multiple copy
emphasized

Challenger Software
3703 131st Ave N
Clearwater, FL 33520
or Call (813) 577-3998

\$49

32K disc
VISA/MC
send for more information
and catalog of other
fine software

PIPELINE

A NEW TANDY MODEL, the long-awaited and much-rumored IBM compatible, has arrived. Officially named the Tandy TRS-80 Model 1200, this machine is said to function identically to the popular IBM PC/XT.

The only Tandy 1200 configuration offered will be a 256K RAM, 360K floppy disk, and 10-meg hard disk system unit and keyboard for \$2,995. Monochrome or color displays and adapters will be offered at an additional price. MS-DOS, the disk operating system, is also sold separately. While Tandy includes MS-DOS with its advanced Model 2000, it is keeping true to IBM's form by not including it in the 1200's price.

* * *

TAKING A BRIEF LOOK at the consumer information services this month, subscribers to The Source may be interested to learn that Ross Jones, treasurer of The Reader's Digest Association, Inc., has been elected chairman of the board of Source Telecomputing Corp. STC, located in McLean, Va., has also announced two new services available for the 60,000 members of The Source Information Network: an Official Airline Guide and worldwide Accu-Weather forecasts. The Official Airline Guide allows members to search through a database of flight schedules and fares, comparing such things as aircraft type, meal service, number of stops and limitations. And with the Accu-Weather database, updated four times daily, members will be able to gather current weather conditions and three-day forecasts from around the world.

Along the phone line at CompuServe, the news is that they, also, are adding two new databases. One, named Disclosure II, is an addition to their Executive Information Service. This service provides information on companies from the American, Over the Counter and New York Stock Exchanges covering company descriptions, financial information, income and balance sheet data, corporate officers' and directors' names and annual remuneration, subsidiary information, and the full text of management decisions. In conjunction, the

Disclosure/Spectrum database lists detailed ownership information of more than 5,000 companies.

As an aside, some of you may be interested in CompuServe's database named "The World of Lotus," a new users' forum for subscribers using software developed by the Lotus Development Corp.

* * *

ADVENTURE CONTEST UPDATE.

The slow, laborious process of judging the huge number of entries in the Second Annual RAINBOW Adventure Contest continues. The judges have been working feverishly night and day (and that's no exaggeration) to make their way through each entry and select the top 20 — those chosen few who will make it into the RAINBOW Book of Adventures.

There are so many exceptional entries this year that it has been difficult pruning the contenders down to a manageable number. If only a few had stood out from the pack, the selection process would have been much simpler, but a lot of THE RAINBOW'S Adventure programming readers have grown remarkably sophisticated.

Hold onto your Indiana Jones fedoras, though; next month, the Adventure begins. The December issue of THE RAINBOW will contain one or two of the finest entries, and we think you'll agree that they were well worth the wait.

* * *

JOINING THE MASTERS. Entries are currently being sought for the Bronx Museum of the Arts exhibition of works by artists who use computers as expressive tools. Such works as computer graphics, computer animation, sound installations and audio art, among others, are eligible.

Videotape submissions must be on three-quarter inch or VHS formats and slides must be 35 mm. The deadline for all entries is December 20, 1984, and you are requested to send duplicates only, accompanied by a SASE. The museum claims no responsibility for original works.

If you're interested in exhibiting one of your creations, send it to the Computer Graphics Exhibition, Bronx Museum of the Arts, 1040 Grand Concourse, Bronx, NY 10456; phone (212) 681-6000.

* * *

MICHTRON ON THE MOVE. Mich-Tron, the producer of several products for the Color Computer, has expanded its operation and moved into a large, new complex. With this move, not only do they expect to have a bit more elbow room, but they should also be better able to serve their customers.

MichTron's new address is 576 S. Telegraph Road, Pontiac, MI 48053; phone (313) 334-6576.

* * *

ECHO, which stands for Electronic Communications for the Home and Office, is a new electronic mail and conferencing service being offered by Budget Time-Share of Marina Del Rey, California. What makes this communications network different is their flat rate of \$10 per month with unlimited access.

Besides electronic mail, ECHO's services include interactive conversations (either one-to-one or in conference), automatic transcripts of conference calls, bulletin boards, databases and users' forums. In the future they expect to offer employment listings, classified advertising and electronic shopping.

For more information about ECHO and their services, contact them at 4739 Alla Road, Marina del Rey, CA 90291; or call Elliot Pressman at (213) 823-8415.

* * *

PEEKs, POKEs AND EXECs are covered exclusively in a new book recently published by Microcom Software. *500 POKEs, PEEKs 'n EXECs for the TRS-80 Color Computer* contains information on these commands that perform functions such as auto-starting BASIC programs, restarting BASIC programs with the Reset button, transferring ROM packs to tape, disabling the BREAK key and Reset buttons, and others.

The book is available for \$16.95, plus \$2 shipping and handling charges. To purchase a copy, write to Microcom Software, P.O. Box 214, Fairport, NY 14450; or call (716) 223-1477.

* * *

SPECTRUMDOS

THE COCO OPERATING SYSTEM

FEATURES and COMMANDS -

Auto Disk Search - Search all drives for files
 MEMO - Full screen editor and screen dump
 AUTO - Automatically adds line numbers
 HIRES - Choice of 32, 51 or 64 characters
 ON ERROR GOTO - Traps all errors
 RUNM - Load & Exec ML files automatically
 ECHO - Output to screen and printer
 Supports 35-80 TRKs, 6ms-30ms & DS/DD

RS DOS

NO
 NO
 NO
 NO
 NO
 NO
 NO

SPECTRUMDOS

YES
 YES
 YES
 YES
 YES
 YES
 YES

SEE AUG '84 RAINBOW REVIEW - 64K DISK \$49.95

SPECTRUM PROJECTS

WEST DIVISION

PO BOX 9866

SAN JOSE, CA 95157-0866

408-243-4558

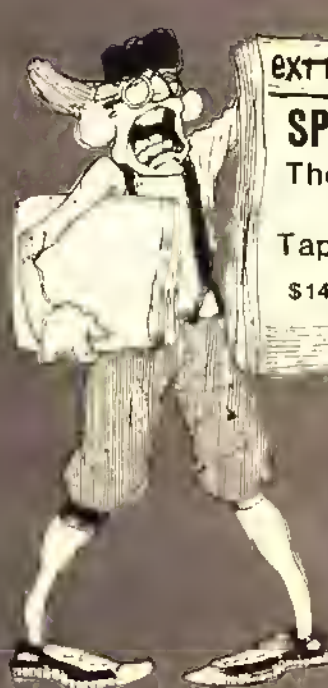
EAST DIVISION

PO BOX 21272

WOODHAVEN, NY 11421

718-441-2807

ALL ORDERS PLUS \$3.00 SHIPPING - NY RESIDENTS ADD SALES TAX



EXTRA **BOOK** EXTRA

SPECIAL EDITION

The Rainbow Book
 and

Tape of Adventures

\$14.95 \$3 S/H Sales Tax

COCO SCREEN
 DUMP!

SEE REVIEW
 THIS ISSUE

ANNOUNCING
 OUR NEW MID-WEST
 DISTRIBUTOR!

**MIDWEST
 SPECTRUM**

PO BOX 348380
 CHICAGO, IL 60634
 312-736-4405

ALL ORDERS PLUS \$3.00 S/H
 ILLINOIS RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS

SOFT AND HARD WARES FOR COLORFUL COMPUTING

SPREADSHEET

Competition **DYNACALC**
Screen 32X16 51X24
Precision 9 digits 16 digits
Hi-Res Graphics NO YES
Visicalc cmd format NO YES
DYNACALC now runs on CoCo DOS!
New low price! 64K Disk \$79.95
(see Sept '84 Rainbow Review)

SAVE \$50 !

BUY 'EM
BOTH FOR
\$129.95

DATA BASE MANAGER

PRO-COLOR FILE "Enhanced" - 60
Data Fields, 8 Report Formats,
1020 bytes/record, Sorts 3
Fields, 4 Screen Formats,
Duplicate Records and Fields,
Global Search - Disk \$79.95
(see June '84 Rainbow Review)

DISK DRIVES

DRIVE D System - 40 trks, Gold
Platted Connectors - \$299.95
AMDEK System - 624K Bytes with
3" Disk Cartridge - \$499.00
DISK CDNRDILLER - \$139.95
(Systems include controller)
DISK Drive 1, 2 or 3 - \$169.95
Single Drive PS & CASE - \$59.95



GAME CONTROLLERS

WICO Command Adaptor - Hookup
2 Atari type joysticks- \$19.95
With 2 Atari joysticks- \$39.95
MACH II Joystick - Beats the
competition! **360 Degree** control
with spring or positive true
positioning and electrical trim
adjustment on both axes- \$39.95

UTILITIES (DISK)

1. CoCo Calligrapher ...\$29.95
2. FHL D-PAK\$34.95
3. Bjork Blocks\$34.95
4. Musica 2\$39.95
5. Super Screen Machine.\$49.95
6. OS-9\$69.95
7. DEFT Pascal\$79.95
8. Microworks MACRO-80C.\$99.95



NEW PRODUCTS

POKES, PEEKS and EXECS ...\$7.95
500 POKES & PEEKS\$16.95
CoCo 40Pin Project Board.\$19.95
Disk Drive Cleaning Kit . \$24.95
6 Outlet Surge Protector \$59.95
DIGITAL Input/Output Card \$99.95
Bare Disk Drive\$129.00
64K to 128K Upgrade\$149.95

WEST
PO BOX 9866
SAN JOSE, CA 95157-0866

SPECTRUM PROJECTS
PO BOX 21272
WOODHAVEN, NY 11421

EAST

ALL ORDERS PLUS \$3.00 SHIPPING - NY RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS

SOFT AND HARD WARES FOR COLORFUL COMPUTING

COMMUNICATION

COLORCOM/E - A complete smart terminal package! Upload Download, Hi-Res (51X24 screen, 300/1200 Baud, Offlin Printing and much more. Rompa or Disk - \$49.95
(see Feb '84 Rainbow Review)

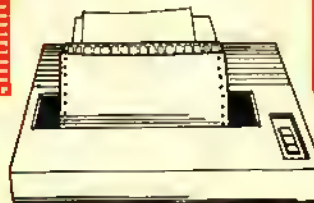


WORD PROCESSING

TELEWRITER-64 - Top CoCo Word Processor for 2 years! Three Hi-Res screens, true lowercase characters, right justification, full screen editor. Tape \$49.95 Disk \$59.95
(see June '83 Rainbow Review)

MODEMS

MINI-MODEM - 300 Baud, Originate/Answer, Full Duplex, Direct Connect - \$79.95
J-CAT Modem - Lowest priced auto/answer modem - \$129.95
HAYES Auto Dial/Answer \$239.95
ANCHOR - 300/1200 Baud \$299.95
Prices include Modem cable.



PRINTERS

GEMINI 10X* - 120 cps, 9X9 dot tractor/friction feed \$299.95
EPSON RX-80* - Faster than the MX-80 plus Grafrax! - \$349.95
* Parallel interface required. PBH Parallel Interface - Save \$40 if ordered with above printers! - \$49.95 (Reg.\$89.95)

KEYBOARDS

SUPER-PRO (Mark Data) \$59.95
PREMIUM (Micronix) \$69.95*
HJL57 PROFESSIONAL \$79.95*
KEYTRONICS Keyboard - \$89.95*
* - Includes free software for function keys. Specify Model/Revision Board. Computers made after OCT'82 please add \$5.



MONITORS

MONOCHROME Monitors - 80X24 screens plus Hi-Res w/AUDIO!
Green - \$99.95 Amber - \$119.95
BMC Color Monitor - \$269.95
VIDEO PLUS - Video Interface for above monitors - \$24.95
CoCo II (Monochrome) - \$29.95
CoCo II(Color) Version - \$39.95

SAVE \$10

OFF COLORCOM/E WITH ANY MODEM
OFF TELEWRITER-64 WITH ANY PRINTER,
KEYBOARD OR MONITOR

SAVE \$10

ORDER PHONE LINES : 718-441-2807 & 408-243-4558

A Special Use For The DOS Command

By Roger Schrag
Rainbow Contributing Editor

The newer Color Computer disk drive systems have a command not found on the older systems. This is the DOS command. You type in DOS to load the OS-9 Disk Operating System.

When you type in the DOS command, the computer reads the entire contents of track 34 on the diskette in drive zero. The computer assumes that track 34 contains a special machine language program which will load and initialize the OS-9 system. However, we can put just about any machine language program on track 34 and have it automatically executed whenever we enter the DOS command.

Auto Start On DOS, or *DosStart* for short, is a BASIC program shown in the listing. *DosStart* lets you type in a BASIC command line up to 255 characters long. It then writes a special machine language program onto track 34 of your

diskette so that whenever you type DOS with this diskette in drive zero, your command line of up to 255 characters will be executed, exactly as if you had just entered this command line from the keyboard.

For example, suppose you have a word processing disk and follow this procedure whenever you want to do some word processing: First, turn on your system. Then insert your diskette in drive zero. Next, *POKE* in your printer's special Baud rate. Then turn *VERIFY ON*. Next, *LOADM* your word processor. Finally, you *EXEC* it.

By using what *DosStart* has to offer, you could make this procedure much simpler: Simply turn your system on, insert your diskette in drive zero, and type DOS. Now the computer will read in the special program that *DosStart* put on track 34, and the computer will execute all of those other commands (the *POKE*, *VERIFY ON*, etc.) without having to type anything on the keyboard.

DosStart puts the special machine language program to be read by DOS onto the first two sectors of track 34. In the disk directory, this space will appear to be allocated to a file named *DOS*

BOOT/DAT. Do not attempt to *LOAD* or *LOADM* this file, because the data is written in a special format which isn't loaded by normal procedures.

If the required portion of track 34 is already allocated to a program on your diskette, you will be informed of this and the procedure will be canceled.

DosStart may be used to make complex initialization procedures simpler and quicker. Your command line may be something as simple as *RUN"PAY-ROLL"* or something as fancy as:

```
CLS(7);DRIVE 1:PRINT"FILE  
DIRECTORY - DRIVE 1":DIR:  
VERIFY ON:POKE 282,0:PRINT  
"HIT (ENTER) TO START":FOR  
X=1 TO 32767: IF INKEYS=CHR$(  
13) THEN LOADM"MAILLIST":  
EXEC:ELSE NEXT X
```

If you decide at a later time to disable the DOS procedure so that you may use that disk space for another program, simply enter *KILL"DOS BOOT/DAT"*.

This is one handy little program that you may have to play around and experiment with to fully understand its capabilities. One limitation: Your command

(Roger Schrag, currently studying computer science at the University of California at Berkeley, enjoys working with the CoCo and writing articles for THE RAINBOW. He also designs and translates programs for Adventure International.)

SPECTRUM VOICE PAK

CoCo I

\$69.95

CoCo II

\$79.95

\$49.95

SPECIAL

see NOV '83
Rainbow
Review

Special price good with purchase of any Talking Software below!
Offer expires Dec 15, 1984. All PAKs work w/\$29.95 Disk "Y" cable!

TALKING SOFTWARE

Talking CoCo BINGO - Same as the popular game of BINGO but this one talks! Contains 20 Bingo player cards, 200 markers with complete documentation. Additional features: Color Graphics, 3 timing levels, ball count and pause control plus Disk compatible. 32K EXT \$24.95

Talking Final Countdown - You must stop the mad general from launching a missile at the Russians and causing WW III ! Has multiple voices for added realism. 32K EXT \$24.95

Educational Software - Computer Island's educational programs turn your CoCo into a true teaching machine. Reinforce basic lessons with the aid of voice. Three/pak special includes Math Drill, Spelling Tester and Foreign Languages. 16K EXT \$24.95

Talking Adventure Generator - Create talking adventure games that are 100% Machine Language and very fast in execution. Up to 99 rooms, 255 objects, 70 command words and 255 conditional flags. Get a head start in the Rainbow Adventure contest **NOW!** 64K Disk \$39.95

Term Talk - A speaking smart terminal program for your CoCo. It contains all the features of an intelligent communications package, plus it talks! (Shades of War Games) 16K EXT Tape \$39.95 Disk \$49.95 (see Mar '84 Rainbow Review)

All orders plus \$3.00 S/H - NY Residents add sales tax

SPECTRUM PROJECTS

WEST DIVISION :

PO BOX 9866

SAN JOSE, CA 95157-0866

EAST DIVISION :

PO BOX 21272

WOODHAVEN, NY 11421

ORDER HOT LINES : 408-243-4558 & 718-441-2807

COLORFUL UTILITIES

NEW!

COCO CHECKER - Something possibly wrong with your CoCo??? CoCo CHECKER is the answer!! Will test your ROMs, RAMs, Disk Drives & Controller, Printer, Keyboard, Cassette, Joysticks, Sound, PIAs, VDG, Internal Clock Speed, and more!! 16K TAPE/DISK **\$19.95**

MULTI-PAK CRAK - Save ROMPAKs to your 64K Disk system using the RS Multi-Pak Interface. Eliminate constant plugging in of ROMPAKs now by keeping all your PAK software on disk. Includes POKEs for "PROBLEM" ROMPAKs. DISK **\$24.95**

TAPE OMNI CLONE - Easily handles programs with auto loaders, no headers, no EOF markers, unusual size blocks and more! Now is the time to get your tape software collection protected ... against loss!!! TAPE **\$24.95**

DISK OMNI CLONE - Back everything up! This amazing program handles "non standard" disks with ease. We haven't found any disk yet that it can't handle. Don't ever be caught without a backup again! Lowest price too! 32K DISK **\$29.95**

NEW!
COCO SCREEN DUMP - The best screen dump program for the Epson & Gemini printers ever! Have the option of standard or reverse images w/regular or double sized pictures. 600-9600 Baud too! A must for Graphicom and Bjork Block users. 16K TAPE/DISK **\$19.95**

NEW!
DISK UTILITY 2.1 - A multi-featured tool for USER FRIENDLY disk handling. Utilize a directory window to selectively sort, move, rename and kill file entries. Lightning fast Disk I/O for format, copy and backup. Examine contents of files, the Granule Table, plus the size, load addresses and entry points of all programs. Single command execution of both Basic and ML programs. 32K/64K Disk **\$24.95** (see Oct '84 Rainbow Review)

MASTER DESIGN - A text designer/editor to generate graphics mode lettering with multiple font sizes, textures, shadowing and thicknesses, plus special patterns for creative backgrounds. Comes with a screen print routine and Letter Head Utility that interfaces with Telewriter-64 and BASIC. DISK **\$34.95** (see July '84 Rainbow Review)


BASIC COMPILER - Convert BASIC pgms into machine language. Produce faster and more compact code than BASIC. Integer compiler w/16K-64K versions included. TAPE **\$39.95**

SCHEMATIC DRAFTING - Save time and design pro looking diagrams using a 480X540 pixel worksheet w/6 viewing windows. Over 30 electronic symbols w/10 definable symbols. Print hard copy and save to disk. 64K DISK **\$49.95** (see Jan '84 Rainbow Review)

COLORAMA - A first-class Bulletin Board package... especially geared towards CoCo users... has an ordering section for those who want to run a mail-order business... supports Color Graphics... one nice piece of work. 64K DISK **\$99.95** July '84 Rainbow

MASTER MAIL - Easy to use... Handles 1000 addresses /single disk... FORM LETTER produces multiple letters... For serious applications. 32K DISK **\$49.95** Jan '84 Rainbow

**IN CANADA CALL
TOLL FREE
800-361-5155**


Dealer/Club inquiries invited
Software submissions welcomed

COLORFUL UTILITIES

NEW!

FAST DUPE II - The fastest Disk copier ever! Will format and backup a diskette in only one pass and can make up to 4 Disk copies at once in 2 minutes! The must utility for every Disk owner. 32K/64K DISK **\$19.95** (see May '84 Rainbow Review)

HIDDEN BASIC - Protect your BASIC programs. Mask your code so CLOAD, CSAVE, LIST, EDIT, DEL and LLIST will not function. TAPE **\$19.95** (see Sept '83 Rainbow Review)

64 COL MOD I/III EMULATOR - Give CoCo a 64XI6 screen. Run Model I/III graphics code without retyping the BASIC statements. 64K DISK **\$19.95** (see May '84 Rainbow Review)

64K DISK UTILITY PACKAGE - Take advantage of an expanded 64K machine. Make an additional 8K of RAM available. Copy ROM cartridges to disk and create a 32K SPOOL buffer for printing. DISK **\$21.95** (see July '83 Rainbow Review)

TAPE/DISK UTILITY - A powerful package that transfers tape to disk and disk to tape automatically. Does an automatic copy of an entire disk of programs to tape. Ideal for Rainbow On Tape to disk. TAPE/DISK **\$24.95** (see Sept '83 Rainbow Review)

NEW!

FAST TAPE - Save and load cassette files at twice the speed! Now you can run tape and printer I/O operations in the high speed mode without a locked up system or I/O ERRORS! "If you are tired of waiting for those long tapes to load, I strongly recommend that you buy this fine utility." TAPE **\$21.95** July '83 Rainbow

GRAPHICOM - The ultimate CoCo graphics development tool with sophisticated editing, preview animation, telecommunications and printer support. Hi-Res graphics for only **\$24.95**. W/Spectrum's Menu Foot Switch **\$34.95**. 64K DISK (see April '84 Rainbow Review)

EZ BASE - A truly user friendly data base program at an affordable price. Maintain inventories, hobby collections, recipes, greeting card lists and much, much more! Hi-Res screen, up to 500 records with 15 fields, record or field search, and a Mailing Labels option. 32K DISK **\$24.95** (see July '84 Rainbow Review)

BLACKJACK ROYALE - A Hi-Res graphics casino blackjack simulation and card counting tutor. Fully realistic play includes: double down, splits, surrender, insurance bets, 1-8 decks, burnt cards, shuffle frequency and more! "This fine program is a must for the CoCo Blackjack player." (Aug '83 Rainbow Review) 32K TAPE/DISK **\$24.95**

SHIPPING \$3.00 - NY RESIDENTS ADD SALES TAX

SPECTRUM PROJECTS

WEST DIVISION

PO BOX 9866

SAN JOSE, CA 95157-0866

408-243-4558

EAST DIVISION

PO BOX 21272

WOODHAVEN, NY 11421

718-441-2807

line may not contain the *INPUT* statement.

If you have any questions or comments, you may reach me at 2054 Manning Avenue, Los Angeles, CA 90025. Due to the high volume of mail I receive, I will not be able to send you a reply unless you include a self-addressed, stamped envelope.

The listing:

```

1 CLEAR 1000:CLB
2 PRINT"AUTD START DN 'DDS'"
3 PRINT"=====
4 PRINT
5 PRINT"ENTER ANY CMDMND THAT"
6 PRINT"YDU WDULD LIKE TD BE"
7 PRINT"EXECUTED UPDN TYPING"
8 PRINT"IN 'DDS':"
9 LINEINPUT B$
10 B$=B$+STRING$(255-LEN(B$),0)
11 FDR X=1 TD 64:READ N$
12 N=VAL("&H"+N$)
13 A$=A$+CHR$(N):CK=CK+N:NEXT
14 IF CK<>5775 THEN 39
15 A$=A$+STRING$(191,0)
16 PRINT"INSERT TARGET DISK AND"
17 LINEINPUT"PRESS ENTER ";N$
18 DSKI$ 0,17,2,C$,D$
19 N$=MID$(C$,67,1)

```

```

20 IF N$<>CHR$(255) THEN 43
21 E$=STRING$(66,201)+CHR$(255)
22 F$=STRING$(128,255)
23 DSKD$ 0,17,2,E$,F$
24 DPEN"D",1,"DDS BDDT"
25 PRINT#1,A$:CHR$(0):PUT#1,1
26 PRINT#1,B$:CHR$(0):PUT#1,2
27 CLDSE:MID$(C$,67)=CHR$(201)
28 DSKD$ 0,17,2,C$,D$
29 PRINT"FUNCTIOND COMPLETE"
30 END
31 DATA 4F,53,00,00,CE,01,6A,37
32 DATA 12,B7,26,3C,BF,26,3D,8E
33 DATA 26,1D,BF,01,6B,DC,BA,FD
34 DATA 26,00,7E,AC,7C,0F,70,AF
35 DATA E4,BE,26,3F,A6,B0,BF,26
36 DATA 3F,4D,26,0E,B6,26,3C,BE
37 DATA 26,3D,B7,01,6A,BF,01,6B
38 DATA B6,0D,35,90,00,00,00,27
39 PRINT"CHECKSUM ERRDR --"
40 PRINT"YDU HAVE ENTERED A"
41 PRINT"DATA LINE INCORRECTLY"
42 END
43 PRINT"THE REQUIRED PORTIDN"
44 PRINT"DF THE DISK IS BEING"
45 PRINT"USED BY A PRDGRAM"
46 PRINT"ALREADY DN THE DISK"
47 END

```

!!! FREE !!!



Learn
HOW to USE
YOUR Color Computer

TRY ONE ON US
FREE
SAMPLE ISSUE
1-800-338 6800
MON.-FRI. 9-5 E.S.T.

Color Micro Journal™
5900 Cassandra Smith Rd.
Hixson, TN. 37343
TEL. (615) 842-4600 • TELEX 558 414 PVT BTH

Subscription Rates
12 Issues a Year

USA-\$12.50 per year.
Canada & Mexico-\$19.50 per year
Surface Foreign-\$24.50 per year.
Airmail Foreign-\$48.50 per year

TM Color Micro Journal is a trademark of Computer Publishing Inc.

A SPECTRUM PROJECTS SHOPPING LIST

A CHIP OFF THE OLD...

6821 Standard PIA	\$9.95
6822 Industrial Grade PIA	\$14.95
MC1372 CoCo Video Driver Chip	\$14.95
6847 VDG Chip	\$17.95
68764 (Fits Ext Basic Skt) Eprom	\$24.95
16K-32K-64K RAM Checker (ROMPAK)	\$24.95
6883 SAM Chip w/heat sink	\$29.95
6809E CPU Chip	\$29.95
Basic ROM 1.2 Chip (30% FASTER)	\$39.95
Disk ROM 1.1 (New DOS Command)	\$39.95
Ext Basic 1.1 ROM - NEW LOW PRICE	\$49.95
CoCo First Aid Kit - includes 2 PIAs, 6809E & 6883 (Be Prepared)	\$69.95
O.Kitsz Lowercase and Special Symbol Board - Specify CoCo Model I/II	\$79.95
Intronics Eprom Programmer	\$139.95

COCO LIBRARY...

Color Computer Tech Manual	\$7.95
The World Connection - All about Bulletin Boards, Modems & Sysops	\$9.95
CoCo Memory Map	\$12.00
CoCo Secrets Revealed	\$14.95
The FACTS - Inside "guts" of CoCo	\$14.95
Basic 09 Tour Guide	\$18.95
Disk Basic (1.0/1.1) Unraveled	\$19.95
CoCoINDX - 1800 CoCo articles	\$19.95
New! CoCo II Service Manual	\$19.95

MORE GOOD STUFF...

CoCo Light Pen w/6 programs	\$24.95
16K DOS Card - Plugs into J&M controller and allows you to map an extra 8K Eprom above DOS. Great for utilities.	\$24.95
CoCo Voice Chip - Votrax SC01A	\$34.95
PBH Parallel Interface - Beats Botek! 300-9600 baud w/ptr-modem switch	\$69.95
The Spectrum Switcher - Have your Disk & Cartridge too! Dual Slot System	\$69.95
Disk Interface w/1.1 ROM	\$139.95
PBJ WORD-PAK 80X24 Video Board	\$139.95
CoCo 10 Meg Hard Disk System	\$1495.00

COCO CABLES AND...

Four Pin Male to Four Pin Female Extension- 15 feet. Move your printer or modem to another location.....\$14.95
Tired of plugging and unplugging devices from the RS232 port? Make your life easier. Try our RS232 "Y" cable ..\$19.95
Joystick/Touch Pad 10' Extender - For more convenience & flexibility ...\$19.95
Disk Interface/Rom Pak Extender - Move your disks and ROM Paks where you want them. Gold connectors.* (3 feet) ..\$29.95
Triple RS232 Switcher - Now select one of any three RS232 peripherals ...\$29.95
40 Pin Dual "Y" Cable - Hook up a Disk w/Voice or Word Pak, X-Pad, etc ..\$29.95
 *NOT for use with Multipak

OTHER GOOD STUFF...

C-10 tapes in any quantity49 cents
 5 1/4 Diskettes in any quantity ...\$1.99
 Joystick, Cassette or Serial plug ..\$3.99
 32K, 64K or 128K RAM Button\$4.99
 GEMINI 10X/OKIDATA Ribbon\$4.99
 Amdek 3" diskettes in any quantity..\$5.99
 Epson MX/RX 80 Cartridge\$6.99
 Rompak w/Blank PC Brd 27xx series ..\$9.95
 RS Disk Controller Case\$9.95
The Disk Doubler - Doubleside your 5 1/4 diskettes for 160K more storage ..\$14.95
Video Clear- Cleanup TVI for good!\$19.95
The Magic Box - load Mod I/III Basic program tapes into the CoCo\$24.95
DOS Switcher - Select any DOS (Disk 1.0 1.1, JDOS) inside J&M controller ..\$24.95
CoCo Cooler- State O,E or CoCo II \$49.95
Stereo Hardware Music Synthesizer w/3 hours of (100) four voice songs! ..\$79.95

SPECTRUM PROJECTS

EAST DIVISION :

PO BOX 21272
WOODHAVEN, NY 11421

WEST DIVISION :

PO BOX 9666
SAN JOSE, CA 95157-0666

ALL ORDERS PLUS \$3.00 S/H

NY RESIDENTS ADD SALES TAX

718-441-2807 / 408-243-4558

SPECIAL 64K RAM CHIPS \$49.95

COOKING
With
CoCo



PART V

By Colin J. Stearman

In which the CoCo kitchen will cook up something SLOW, FAST, and COLD.

It's time we got down to some BASIC cooking and add the code for many of the new commands.

New BASIC Commands

When you add the assembly language in Listing 1 to last month's listing (I will tell you how to do this shortly), it will add the following commands and functions:

COLD

This is a Reset command from the keyboard. When you issue it, any program in memory will be lost and BASIC will be "cold" started. This is useful if you have corrupted BASIC somehow and it performs exactly the same as entering the BASIC command `POKE &H71,0:EXEC &HA027`. The start-up banner will be displayed and the `AUTO-EXEC.BAS` file will be run.

(Colin J. Stearman is an electronics engineer educated in the U.K. He has worked with all kinds of computers and has been a CoCo enthusiast for over two years.)

WPOKE

This is like `POKE`, but is WORD oriented instead of byte. The syntax is the same as `POKE`, but the value can be anything from zero to 65535. This number is poked into the given address and the next address location.

FAST

Issuing this command puts CoCo into high gear and is exactly the same as `POKE 65495,0`. You can run the disk system in the FAST mode if you remove capacitor C85 from the mother board. This is a 220pF capacitor on the "Cartridge Select Signal" at pin 32 socket and ground. A word of warning though: do not attempt any disk input/output while in the FAST mode, because it will surely fail!

SLOW

No prizes for guessing what this one does; it issues the equivalent of `POKE 65494,0` and should be performed whenever a FAST has been issued and disk input/output is required.

XEQ(M)

If you type in `XEQ "GAME"`, it is exactly the same as entering `RUN`

"GAME"; in other words the BASIC program "GAME.BAS" is retrieved from the disk and run. However, if you enter *XEQM"GAME"*, then the machine code program "GAME.BIN" will be loaded from disk and started up. It's equivalent to entering *LOADM"GAME":EXEC*.

AUTO

This "direct only" command automatically generates BASIC program line numbers. If you just enter *AUTO* then the first line will be 10 and the increment will be 10. If you enter *AUTO 100*, for example, the first line number generated will be 100, with an increment of 10. If you enter *AUTO 4,2* the first line number will be four with an increment of two. To exit the *AUTO* mode, either press *BREAK* or *ENTER* immediately after the line number.

SCANS

SCANS is a function similar to *INKEYS*. Its syntax is the same. However, *SCANS* will wait for a key to be pressed rather than continuing on like *INKEYS*. So, if you have a program Line 100 *AS=SCANS*, the program will wait at Line 100 until a key is pressed, and the key value will be assigned to *AS*.

DATES

This string function will return the current date stored in the computer. The format of the date is mm/dd/yy, for example 06/12/84. It is always eight

characters long. You can use *DATES* like any other string variable, including assigning it to another string variable with an "equals" statement, or manipulating it with *MIDS*, *LEFTS*, etc. However, you cannot assign a new string value to it by having it on the left side of an equals sign.

Once this code has been added we can "uncomment" some lines from last month (details below), and the *DIR* command will now pause after the screen fills, awaiting any key to continue. Also, the creation date of each file will be displayed in the directory.

Listing 2 is a BASIC program called "DATESET.BAS" which sets the date and also dates any undated files on the disk. Files created before you patched BASIC can be dated this way and also any files created by machine language programs which do not use BASIC to open them. Files will be dated if their date fields in the directory contain \$0000 or \$FFFF. Files with legitimate dates will not be changed. I have this file on my main editor disk and renamed it "AUTOEXEC.BAS" so it runs every-time I start up.

WPEEK

This is the complement of *WPOKE* and will return the *WORD* stored at the given address and the next consecutive address. The value returned is in the range zero to 65535. The syntax is the same as for *PEEK*.

Adding The New Functions

Call in last month's listing and make the following changes using the [REF#] given as a locating guide. Remove the commenting asterisk from reference Lines 3 and 5. Then delete reference Lines 12 through 17, 23, 24 and 28. Also, delete the last four lines of last month's listing starting with the line "ZZLAST EQU *-1", as these are in this month's listing.

Now type in the new assembly language code found in Listing 1. Finally, reassemble the result and try it as you did last month's listing. The commands and functions should all work as advertised. If not, double check all your typing or subscribe to RAINBOW ON TAPE!

Coming Next Month

The next installment will be devoted entirely to the construction of the parallel interface and the software to integrate it into BASIC. So clean up the CoCo kitchen and we'll go to it next month.

If you would like the entire *DOS PATCH* program source, along with binary files with and without the parallel port driver for DECB 1.0 and DECB 1.1, just send me a disk (no cassettes please) along with \$6 and a stamped, addressed disk mailer. I will load the disk and return it to you promptly. Address this request or any questions to: Colin Stearman, 143 Ash Street, Hopkinton, MA 01748.

Listing 1:

```
>>>UNKNOWN NAME--
0917      DPT LIS
0918 *****
0919 * PATCH #3 to RSDOS (C)1984 Colin Stearman *
0920 *****
0921 *
0922 *****
0923 * "COLD" performs a cold restart
0924 COLD CLR #71      RESET COLD FLAG
0925 JMP #A027          RESTART BASIC
0926 *****
0927 * "WPOKE" COMMAND
0928 WPOKE JSR #B73D    SET 1ST ARGUMENT # TO FFFF
0929 STX #2B            & SAVE TEMPORARILY
0930 JSR #B26D          PARSE OVER REQUIRED COMMA
0931 JSR #B73D          GET SECOND ARGUMENT
0932 STX #12B3         DO DOUBLE POKE
0933 RTS               RETURN TO BASIC
0934 *****
0935 * "FAST"
0936 *
0937 FAST STA #5495     SPEED UP PROCESSOR
0938 RTS
0939 *****
0940 * "SLOW"
0941 *
0942 SLOW STA #5494     SLOW DOWN PROCESSOR

DB72 39
DB73 B14D
DB75 2703
DB77 7EAE75
DB7A B0CEE5
DB7D 7FFF40
DB80 6E9F009D

#943      RTS
#944 *****
#945 * "XEQ" COMMAND
#946 XEQ CMPA #*N      XEQM"
#947 BEQ XEQH          YES
#948 JMP #AE75         NO - SAME AS RUN
#949 IEQH JSR #A021    DO LOADM
#950 CLR #FF40         STOP DRIVE MOTOR
#951 JMP [19D]        EXEC
#952 *****
#953 * "AUTO n,1"
#954 *
#955 AUTO JSR DIRECT   CURRENT BASIC LINE #
#956 BNE SYNERR         SYNTAX ERROR
#957 LDD #100A          DEFAULT LINE #
#958 STD LINNUM         SAVE IT
#959 STD INCNUN         SAVE IT FOR INCREMENT TOO
#960 JSR #A05           ANY MORE ON LINE?
#961 BEQ NONORE
#962 JSR #B73D          EVALUATE ARGUMENT
#963 LDD #152           GET IT IN D
#964 STD LINNUM         OVERRIDE DEFAULT LINE #
#965 JSR #A05           ANY MORE VALUES?
#966 BEQ NONORE
#967 JSR #B26D          PARSE COMMA
#968 JSR #B73D          EVALUATE IT
#969 LDD #152           BET IT IN D
#970 BEQ SYNERR        CANNOT BE ZERO
#971 STD INCNUN         OVERRIDE DEFAULT
#972 JSR #A05           ANY MORE ON LINE?
#973 BNE SYNERR        ERROR IF SO
```

0003 86FF	#974 MONORE LDA	#9FF	SET UP AUTO FLAG	DC21 B003	1030 * X IS RETURNED WITH ADDRESS OF STRING START
0005 B70149	#975 STA	AUTOFB		DC23 7EB69B	1039 BSR DATGET PUT CURRENT DATE AT B
0008 39	#976 RMB	ALL ODNE			1040 JNP #B69B EXIT VIA STRING CODE
	#977 *****				1041 *****
	#978 * This is the trap routine to see if in				1042 * DATGET PUTS MM/DD/YY AT ADDRESS IN X BASED UPON
	#979 * AUTO mode				1043 * VALUE AT DATUM. DATE IS STORED AS FOLLOWS:
	#980 *				1044 * 15 - 9 8 - 5 4 - 0
0009 7D0149	#981 INPUT TST	AUTOFB	AUTO MODE?	DC26 FC014E	1045 * YEAR (MOD1700) MONTH DAY
000C 270C	#982 BEQ	INEXIT			1046 DATGET LOD DATUM GET DATA FOR MONTH
	#983 *****				1047 * ENTER BELOW WITH DATE ALREADY IN D
000E FC01D1	#984 DOAUTO LOD	LINNUM	GET LAST LINE NUMBER	DC29 3406	1048 DATOUT PSMS D SAVE ON STACK
00C1 10B3F9FF	#985 CMPD	#1F9FF	TOO HIGH?	DC2B 44	1049 LSRA GET UPPER BIT IN CARRY
00C5 2304	#986 BLS	NOTHI		DC2C 56	1050 RDRB MOVE DOWN
00C7 7F0149	#987 CLR	AUTOFB	RESET FLAG	DC2D 54	1051 LSRB MOVE DOWN
00CA 39	#988 INEXIT RTS		RETURN	DC2E 54	1052 LSRB MOVE DOWN
	#989 *			DC2F 54	1053 LSRB MOVE DOWN
	#990 *****			DC30 54	1054 LSRB MOVE DOWN
00CB 0F07	#991 NOTHI CLR	#07	INKEY STORE	DC31 B016	1055 BSR DECODE PUT CHARACTERS IN BUFFER
00CD 0F70	#992 CLR	#70	FLAG BUFFER FLUSHED	DC33 062F	1056 LDA #'/
00CF EDE4	#993 STD	,S	D SAVE CURRENT VALUE OVER RETURN	DC35 A700	1057 STA ,X+
00D1 F30103	#994 ADDD	TNCNUM	INCREMENT IT	DC37 E66T	1058 LOD ,S GET DAY
00D4 F001D1	#995 STD	LINNUM	AND SAVE IT	DC39 C41F	1059 ANOB %X000T1111 MASK OFF MONTH
00D7 3506	#996 PULS	D	GET OLD VALUE OFF STACK	DC3B 8D0C	1060 BSR DECODE
00D9 8D0DCC	#997 JSR	#D0CC	DISPLAY NUMBER	DC3D 062F	1061 LDA #'/
00DC 0620	#998 LDA	#020	SPACE	DC3F A700	1062 STA ,X+
00DE BDA2B2	#999 JSR	CHROUT	DISPLAY IT	DC41 E6E4	1063 LOD ,S GET UPPER BYTE
00E1 CE03DA	1000 LOD	#03DA	WHERE CONVERTED * IS	DC43 54	1064 LSRB POSITION YEAR DATA
00E4 BE02D0	1001 LDX	#BASBFR	POINT TO BASIC BUFFER	DC44 B003	1065 BSR DECODE GET CHARACTERS IN A,B
00E7 5F	1002 CLRB		SET UP CHARACTER COUNTER	DC46 3262	1066 LEAS 2,S REMOVE DATE FROM STACK
00E8 A6C0	1003 ILDBP	,U*	BET FIRST CHAR	DC48 39	1067 RTS
00EA 2700	1004 BEQ	G0TNUN	GET ALL NUMBERS		1068 *
00EC A780	1005 STA	,X*	MOVE TO BUFFER	DC49 4F	1069 DECODE CLRA SET UP TENS COUNTER
00EE 5C	1006 INCB		COUNTER UP	DC4A C00A	1070 SUBTEN SUBB #0 REDUCE BY TEN
00EF 20F7	1007 BRA	ILDBP	CONTINUE	DC4C 2503	1071 BLD BOTTEN EXIT AS NENT NEG
	1008 * JUMP IS HERE SO EVERYONE CAN GET IT WITHOUT			DC4E 4C	1072 INCA INCREMENT TENS
	1009 * LONG BRANCHING			DC4F 20F9	1073 BRA SUBTEN CONTINUE SUBTRACTING
00F1 7EDA2F	1010 SYNERR JMP	SNERR			1074 *
	1011 *			DC51 C03A	1075 GOTTEN ADDB #T000 RESTORE UNITS AND
00F4 0620	1012 G0TNUN LDA	#020	SPACE	DC53 8B30	1076 ADDA #0 TENS TO ASCII
00F6 A700	1013 STA	,X*	SAVE IT AT BUFFER END	DC55 E0B1	1077 STD ,X** SAVE IN BUFFER
00F8 5C	1014 INCB		COUNT IT	DC57 39	1078 RTS
00F9 BDA171	1015 JSR	#A171	READ A CHARACTER		1079 *****
00FC 010D	1016 CMPA	#0D	RETURN?		1080 * 'WPEEK'
00FE 2704	1017 BEQ	ENDAUT	END AUTO FUNCTION		1081 *
DC00 8103	1018 CMPA	#03	BREAK?		1082 *WPEEK RETURNS 2 BYTES
DC02 2609	1019 BNE	INDONE	NOT SPECIAL SO EXIT	DC58 B0B740	1083 WPEEK JSR #B740 INTEGERIZE PARSED VALUE
DC04 7F0149	1020 ENDAUT CLR	AUTOFB	RESET FLAG	DC5B EC84	1084 LOD ,X DO DOUBLE PEEK
DC07 CC0001	1021 LOD	#0001	GET A RETURN IN A, 1 CHR IN D	DC5D D052	1085 UNSIGN STD #52
DC0A BE02D0	1022 LDX	#BASBFR	POINT TO BUFFER START	1086 JMP	#B00E SEND UNSIGNED 0 TO VARIABLE
DC0D 7EA39D	1023 INDONE JMP	#A39D	CONTINUE BASIC LOOP		1087 *****
	1024 *****				1088
	1025 * 'SCAN'				1089
	1026 *				1090
DC10 9687	1027 SCAN LDA	#07	HAS A KEY BEEN PRESSED?	DC61	1091 ZLAST EQU *-1 Last used address value
DC12 2605	1028 BNE	G01KEY	YES, RETURN WITH CODE		1092 *
DC14 B0ATC1	1029 YSCAN JSR	#A1C1	NO CALL KEY SCAN		1093 * ZLAST must not be greater than #DFFF for
DC17 27FB	1030 BEQ	YSCAN	KEEP LOOKING		1094 * DOS 1.0 and 40EFF for DOS 1.1. The latter
DC19 7EA56B	1031 G01KEY JMP	#A56B	RETURN A T CHAR. STRING		1095 * has the OS-9 boot program and SWI sel routine
	1032 *****				1096 * from #DF00 to #DF4C
	1033 *				1097 *
	1034 * 'DATE'				1098 *
	1035 *				1099
DC1C C60B	1036 DATE LDB	#B	CHARACTERS IN MM/DD/YY	D994	1100 END ADDCOM
DC1E 8D050F	1037 JSR	#B50F	VERIFY SPACE AVBLB, ALLOCATE		NO ERROR(S) DETECTED

Listing 2:

5 * "DATESET.BAS" LISTING #2 COO
KING WITH COCO- PART 5

230 83
END 200

```

10 CLEAR 1000
20 *DATE LOADER
30 DIM DAYS(12)
40 DATA 31,28,31,30,31,30,31,31,
30,31,30,31
50 FOR I=1 TO 12
60 READ DAYS(I)
70 NEXT
80 IF WPEEK(&H14E)<>0 AND WPEEK(

```



```

&H14E)<>&HFFFF THEN 210
90 INPUT"DATE(MM,DD,YY)";M,D,Y
100 IF M<0 OR M>12 THEN 240
110 IF Y<0 THEN 240
120 IF D<1 THEN 240
130 IF M=2 THEN 160
140 IF D>DAYS(M) THEN 240 ELSE 1
90
150 ' DD FEBRUARY
160 IF (INT(Y/4)<>Y/4) AND (D>DAYS(
M)) THEN 240
170 ' LEAP YEAR
180 IF D>29 THEN 240
190 DATE =(Y*INT(2^9))+(M*INT(2^
5))+D
200 WPDKE &H14E,DATE
210 INPUT"DATE FILES";A$
220 IF LEFT$(A$,1)="Y" OR LEFT$(
A$,1)="y" GDSUB 250
230 NEW
240 PRINT"ERRDR":GDTD90
250 ' FILE REDATER
260 ' DATES ANY FILES WITH ZERD
DR 255
270 ' IN THE DATE FIELD WITH TDD
AYS DATE
280 INPUT"DRIVE ND";DR

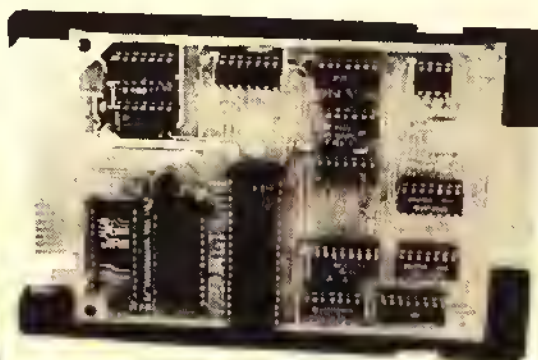
```

```

290 PRINT"THESE FILES REDATED WI
TH ";DATE$
300 IF DR<0 OR DR>1 THEN 280
310 FDR X= 3 TO 11
320 DSKI$ DR,17,X,A$,B$
330 A$=A$+LEFT$(B$,127)
340 FDR N=0 TO 7
350 FILE$=MID$(A$,N*32+1,8)
360 EXT$=MID$(A$,N*32+9,3)
370 IF ASC(FILE$)=0 THEN 450
380 IF FILE$=STRING$(8,255) THEN
FLAG=1:GDTD460
390 MSB=ASC(MID$(A$,N*32+17,1))
400 LSB=ASC(MID$(A$,N*32+18,1))
410 IF MSB=0 AND LSB=0 THEN 430
420 IF MSB<>255 OR LSB<>255 THEN
450
430 MID$(A$,N*32+17,2)=CHR$(PEEK
(&H14E))+CHR$(PEEK(&H14F))
440 PRINTFILE$+"."+EXT$
450 NEXT N
460 B$=RIGHT$(A$,127)
470 A$=LEFT$(A$,128)
480 DSKD$ DR,17,X,A$,B$
490 IF FLAG=1 THEN 510
500 NEXT X
510 RETURN

```

NEW! HDS FLOPPY DRIVE CONTROLLER



FEATURES:

- GOLD PLATED EDGE CARDS
- DUAL SELECTABLE ROM SOCKETS
- NO POTS TO ADJUST
- COMPATIBLE WITH COCO I & II
- 120 DAY WARRANTY
- DOUBLE AND SINGLE DENSITY
- FULLY SOCKETED BOARD

REDUCE YOUR I/O ERRORS WITH THE NEW HARD DRIVE SPECIALIST FLOPPY DRIVE CONTROLLER FOR THE COLOR COMPUTER. GOLD EDGE CARD CONNECTORS AND THE ABSENCE OF POTENTIOMETERS MAKE THIS THE BEST BOARD AVAILABLE TO DATE. SOLD WITH AND WITHOUT ROM (Read Only Memory)

COMPLETED & TESTED BOARD WITH ROM (INCLUDES CASE AND DOS INSTRUCTIONS)	\$139.00
COMPLETED & TESTED BOARD WITHOUT ROM (INCLUDES CASE)	\$119.00
BARE BOARD WITH INSTRUCTION MANUAL (ADD \$40. FOR COMPLETE PARTS KIT, ADD \$20. FOR ROM)	\$39.95

HARD DRIVE SPECIALIST

Ordering Information
We accept Visa, Mastercard, Wire Transfers, and Certified checks for
quickest shipping. Orders received on personal checks are held

Dealer inquiries invited
16206D Hickory Knoll, Houston, Texas 77059

Order Line
1-800-231-8671
Local Sales and Service Line
1-713-480-6000

THE COLORSOFT™ BUSINESS SYSTEM

INTEGRATED BUSINESS SOFTWARE DESIGNED FOR THE COLOR COMPUTER
WRITTEN FOR USE BY THE NON-ACCOUNTING ORIENTED BUSINESSMAN
CONCISE USERS MANUAL WITH SAMPLE TRANSACTIONS TUTORIAL
PROFESSIONALLY WRITTEN AND FULLY TESTED
HIGHLY USER FRIENDLY AND MENU DRIVEN
AFTER THE SALE SUPPORT

SMALL BUSINESS ACCOUNTING (Version 2.0) This sales-based accounting package is designed for the non-accounting oriented businessman. It also contains the flexibility for the accounting oriented user to set up a double entry journal with an almost unlimited chart of accounts. This package includes Sales Entry, transaction driven Accounts Receivable and Accounts Payable, Journal Entry, Payroll Disbursement, and Record Maintenance programs. Screen and hardcopy system outputs include Balance Sheet, Income Statement, Customer and Vendor Status Reports, Accounts Receivable and Payable Aging Reports, Check Register, Sales Reports, Account Status Lists, and a Journal Posting List. The number of accounts is limited only by the number of disk drives. \$89.95

ACCOUNTS RECEIVABLE (Version 2.0) This package is designed to meet the requirements of most small business users. The system includes detailed audit trails and history reports for each customer, prepares invoices and monthly statements, mailing labels, aging lists, and an alphabetized customer listing. The user can define net terms for commercial accounts or finance charges for revolving accounts. This package functions as a standalone A/R system or integrates with the Small Business Accounting package to build a complete accounting/receivables system. \$59.95

PAYROLL (Version 2.0) This integratable package is designed for maintaining personnel and payroll data for up to 200 hourly and salaried employees with 8 deductions each. This system calculates payroll and tax amounts, prints checks and maintains year-to-date totals. These amounts can be automatically transferred to the SBA package for financial reporting. It computes each pay period's totals for straight time, overtime, and bonus pay and determines taxes to be withheld. Additional outputs include mailing list, listing of employees, year-to-date federal and/or state tax listing, and a listing of current misc. deductions. This system is suited for use in all states except Oklahoma and Delaware. \$69.95

All programs require a minimum of 32K and 1 disk drive but will take advantage of 64K and multiple drives. Each package features a hi-res 51 x 24 black on green screen. 16K versions available without hi-res screen. Specify 16K or 32K versions when ordering. Future integrated packages will include: Inventory Control, Sales Analysis, Accounts Payable.

INCLUDE \$5.00 Shipping/Handling Per Order

Write for Free Catalog

BRANTEX, INC.

COLOR SOFTWARE SERVICES DIV.

BUSINESS SOFTWARE GROUP
P.O. BOX 1708
GREENVILLE, TEXAS 75401



TELEPHONE ORDERS
(214) 454-3674
COD/VISA/MASTERCARD

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

Simple Programs: A Learning Experience For All

By Joseph Kolar
Rainbow Contributing Editor

Is there a newcomer to CoColand, who doesn't want to learn to program?

This article is addressed to the newcomer who has waded through the first 11 chapters of *Getting Started With Basic*. Except for *PLAY*, used in Listing 5, all the statements and functions will be familiar to you.

The project: Create a simple tutorial for pre-schoolers or first graders. The program will add two numerals and display the answer in a vertical format.

PRINTTAB allows us to locate the first character, or space, to be printed on a specified row. *PRINT@* allows us to locate the first character, or space, anywhere on the screen using the *PRINT@* screen location values.

Before we continue, let me assure you that plenty of errors were made during the construction of this program. There are lots of SNs, FCs, ULs and RGs. That is the way it goes! When you create, you make many errors. Note the nature of the error and the line number; try to correct it. If one thing fails to solve the problem you may have the right solution, but you may be inserting it in the wrong place in the listing.

Rest assured that this program was rife with mistakes. Imagine an error every couple of lines. However, let us pretend no mundane SNs or TMs, etc. were made.

Note the tendency to add a line or routine, only to discard or change it later. The original idea is constantly altered as you progress and see new possibilities.

Again, the plan was to add $2 + 3 = 5$ using *PRINTTAB* and a vertical presentation. As we work our way through

this creative session, try to anticipate what happens next. You need not key in any of the listings.

Put a fresh cassette in your recorder and fire up the computer. Read on and create with me.

Key in the following lines that add $2+3$ and displays the answer. Remember, you may stop and *RUN* at any time to see what is what.

```
5 CLS
10 PRINTTAB(15)"2"
20 PRINTTAB(14)" +3"
30 PRINTTAB(14)"-- :INPUT A
50 PRINTTAB(14)A
```

Move down to center the screen display.

```
6 FOR Y=1 TO 5:PRINT:NEXT
```

Determine if the answer is correct and count each correct answer.

```
60 IF A=5 THEN X=X+1
```

Determine if the answer is wrong and repeat the problem.

```
61 IF A<>5 THEN GOTO 5
```

If the answer is correct, so state with a line of text. If we expect to present many problems, it is best to use a *GOSUB* routine to avoid the bother of keying in the same line over and over.

```
1000 PRINT@322, "YOU GOT"X" RIGHT SO FAR!"
```

(Joseph Kolar is a free-lance writer and programmer dedicated to proselytizing for computers in general, and the CoCo specifically.)

Every *GOSUB* requires a *RETURN*.

```
1030 RETURN
```

We must send the CoCo to the subroutine. Add to end of Line 60:

```
<:GOSUB 1000>
```

Also, we must tell the computer to go somewhere. Set up for another problem.

```
70 GOTO 2000
```

Make two copies of work in progress, *CSAVE"ADD"*.

In order to get to the next routine, we need an *INPUT* routine and clear the screen. We skip a row.

```
1010 PRINT:PRINT:INPUT"  
PRESS <ENTER>";OA  
1020 CLS
```

At this point, we need another problem routine. We take the routine, Lines 6-70 and beginning at Line 2000, keeping the same line number intervals, copy the routine, using three and one for the variable values in the new routine. We do this by *LIST* and using the new line numbers, copy Lines 6-70, from your monitor, changing the necessary variable values, for the display on the screen.

Remember to change the value of A in Lines 2050 and 2051 to the correct answer, four.

RUN. We find we forgot to clear the screen to re-attempt the problem. Insert at beginning of Line 2000 *<CLS>*.

To make sure X is being tabulated correctly, we add a third problem. But, being nervous, we make sure that we start with zero correct answers:

```
4 X=0
```

Beginning at 3000, we copy the routine in the 2000 block, using two and two for the problem elements. We loop Line 2051 back to 2000 to re-try the problem if an incorrect answer is given.

To make sure that we flip to Line 4000, a little message is inserted to verify that we got there safely.

```
4000 PRINT"NEXT PANEL PLEASE"
```

RUN. Input only correct answers; then input only incorrect answers; then a few incorrect answers and the right answer. Observe if the score is incremented properly.

Make two copies of work in progress *CSAVE"ADDA"*.

```
0 'ADDA  
4 X=0  
5 CLS  
6 FOR Y=1 TO 5:PRINT:NEXT  
10 PRINTTAB(15)"2"  
20 PRINTTAB(14)" +3"  
30 PRINTTAB(14)"-- " ;:INPUTA  
50 PRINTTAB(14)A  
60 IF A=5 THEN X=X+1:GOSUB1000
```

```
61 IF A<>5 GOTO5  
70 GOTO2000  
1000 PRINT@322,"YOU GOT"X"RIGHT  
SO FAR!"  
1010 PRINT:INPUT" PRE  
BB <ENTER>";OA  
1020 CLS  
1030 RETURN  
2000 CLS:FOR Y=1 TO5:PRINT:NEXT  
2010 PRINTTAB(15)"3"  
2020 PRINTTAB(14)" +1"  
2030 PRINTTAB(14)"-- " ;:INPUTA  
2040 PRINTTAB(14)A  
2050 IF A=4 THEN X=X+1:GOSUB1000  
2051 IF A<>4 THEN GOTO2000  
2060 GOTO3000  
3000 CLS:FOR Y=1 TO 5:PRINT:NEXT  
3010 PRINTTAB(15)"2"  
3020 PRINTTAB(14)" +2"  
3030 PRINTTAB(14)"-- " ;:INPUTA  
3040 PRINTTAB(14)A  
3050 IF A=4 THEN X=X+1:GOSUB1000  
3051 IF A<>4 THEN GOTO2000  
3060 GOTO4000  
4000 PRINT"NEXT PANEL PLEASE."
```

Looking over the listing, we note that Lines 5 and 6; 2000; 3000; are the same. Rather than keying in this line every time we add a problem block, we decide to *<DEL5-6>* and create a subroutine.

```
60000 CLS:FOR Y=1 TO 5 :PRINT:NEXT  
60001 RETURN
```

Then we send each problem routine to the new subroutine.

```
6 GOSUB 60000  
2000 GOSUB 60000  
3000 GOSUB 60000
```

We notice that *CLS* in Lines 2000 and 3000 are redundant, being included in the new subroutine, so we *EDIT* them out of the two lines.

When we *RUN* the program, an RG Error in Line 6001 appears because CoCo doesn't know where to go. It does this because after the third problem panel is completed, CoCo notes Lines 4000; 60000; at 60001 it is frustrated. If we don't tell it to go someplace, we need an infinite loop to keep CoCo from reaching the subroutine. Let's keep CoCo happy.

```
4001 GOTO 4001
```

Make two copies of work in progress. *CSAVE"ADDB"*.

```
0 'ADDB  
4 X=0  
5 CLS  
6 GOSUB60000  
10 PRINTTAB(15)"2"
```



```

20 PRINTTAB(14)" +3"
30 PRINTTAB(14)"--      ";; INPUTA
50 PRINTTAB(14)A
60 IF A=5 THEN X=X+1:GOSUB1000
61 IF A<>5 GOTO5
70 GOTO2000
1000 PRINT@322,"YOU GOT"X"RIGHT
SO FAR!"
1010 PRINT:INPUT"          PRE
SS <ENTER>" ;OA
1020 CLS
1030 RETURN
2000 GOSUB60000
2010 PRINTTAB(15)"3"
2020 PRINTTAB(14)" +1"
2030 PRINTTAB(14)"--      ";; INPUTA
2040 PRINTTAB(14)A
2050 IF A=4 THEN X=X+1:GOSUB1000
2051 IF A<>4 THEN GOTO2000
3000 GOSUB60000
3010 PRINTTAB(15)"2"
3020 PRINTTAB(14)" +2"
3030 PRINTTAB(14)"--      ";; INPUTA
3040 PRINTTAB(14)A
3050 IF A=4 THEN X=X+1:GOSUB1000
3051 IF A<>4 THEN GOTO2000
4000 PRINT"NEXT PANEL PLEASE."
4001 GOTO4001
60000 CLS:FOR Y=1 TO 5:PRINT:NEX
T
60001 RETURN

```

We would like to get randomly selected problems because that makes for a better program. The problem now is to make the problems change randomly and give the correct answers. We decide the parameters to add numerals one through five, to numerals one through five.

```
7 Q=RND(5):R=RND(5)
```

Q is the variable assigned to the first numeral and R is assigned for the second numeral. Since the first numeral is placed on the screen in Line 10, we change it to read:

```
10 PRINTTAB(15)Q
```

The second numeral is placed on the screen in Line 20.

```
20 PRINTTAB(14)" + "R
```

Since we are using the input variable A as the answer, the right answer must be $A=Q+R$. Any other answer is wrong, $A \neq Q+R$. We change the number 5 in Lines 60 and 61 to $Q+R$.

```

60 IF A=Q+R THEN X=X+1:
GOSUB1000
61 IF A<>Q+R THEN CLS:
GOTO5

```

If we get an incorrect answer, we must return to Line 5. If we do, the next time around, we should get a new problem. We note the routines look good. As a safety precaution,

we don't want to take a chance and have Q added to Q or R added to R. We make sure by adding reset values of zero to Q and R.

```
5 CLS:Q=0:R=0
```

As it is, they are unnecessary because Line 7 will reset to new values. Remember, we can always delete unnecessary information later.

We make two copies of the work in progress. *CSAVE"ADDC"*.

```

0 'ADDC
4 X=0
5 CLS:Q=0:R=0
6 GOSUB60000
7 Q=RND(5):R=RND(5)
10 PRINTTAB(15)Q
20 PRINTTAB(14)" + "R
30 PRINTTAB(14)"--      ";; INPUTA
50 PRINTTAB(14)A
60 IF A=Q+R THEN X=X+1:GOSUB1000
61 IF A<>Q+R THEN CLS:GOTO5
70 GOTO2000
1000 PRINT@322,"YOU GOT"X"RIGHT
SO FAR!"
1010 PRINT:INPUT"          PRE
SS <ENTER>" ;OA
1020 CLS
1030 RETURN
2000 GOSUB60000
2010 PRINTTAB(15)"3"
2020 PRINTTAB(14)" +1"
2030 PRINTTAB(14)"--      ";; INPUTA
2040 PRINTTAB(14)A
2050 IF A=4 THEN X=X+1:GOSUB1000
2051 IF A<>4 THEN GOTO2000
3000 GOSUB60000
3010 PRINTTAB(15)"2"
3020 PRINTTAB(14)" +2"
3030 PRINTTAB(14)"--      ";; INPUTA
3040 PRINTTAB(14)A
3050 IF A=4 THEN X=X+1:GOSUB1000
3051 IF A<>4 THEN GOTO2000
4000 PRINT"NEXT PANEL PLEASE."
4001 GOTO4001
60000 CLS:FOR Y=1 TO 5:PRINT:NEX
T
60001 RETURN

```

We don't need $Q=0$ and $R=0$ after *RUN* and checking out the work. We edit them out.

```
5 CLS
```

We get a new problem by looping Line 70 back to Line 5.

```
70 GOTO 5
```

Line 50 doesn't align properly, so we move over one space to the right.

```
50 PRINTTAB(15)A
```



RAINBOWfestSM

Irvine

Feb. 15-17

Joining in the fun and excitement of **RAINBOWfest** is a great way to get to know the CoCo Community. Many of those who write for **THE RAINBOW** — and those who are written about — attend CoCo's very own show. It's a people-to-people event as well as a valuable learning experience.

For the 1984-85 season, we've scheduled three **RAINBOWfests** in three parts of the country. If you missed the **RAINBOWfest** in Princeton, N.J., why don't you make plans now to be with us in Irvine, Calif., or Chicago, Ill.? Each show will offer fun, excitement, new products, seminars and information for your CoCo! And for those who (perish the thought) don't like CoCo as much as you, we've scheduled each

RAINBOWfest in an area that will provide fun and enjoyment for the whole family.

Our Irvine, California, show is being held at the Irvine Marriott Hotel, which offers special rates for **RAINBOWfest**. The show opens Friday evening with a 7 p.m. to 10 p.m. session. It's a daytime-only show Saturday — the CoCo Community Breakfast is at 8 a.m., then the exhibit hall opens promptly at 10 a.m. and runs continuously until 6 p.m. There will be no exhibition hours or seminars Saturday evening. On Sunday, the exhibit hall opens at 11 a.m. and closes at 4 p.m.

Our highly popular CoCo Community Breakfast will again feature a well-known figure from the Color Computer Community. And the exhibition will be interspaced with a number of seminar sessions on all aspects of CoCo — from

writing in machine language to making your BASIC work better.

But most of all, there will be exhibitors. Lots of them. All ready to demonstrate products of every kind. Some with special programs and hardware items to introduce. Others with show specials.

Tickets can be secured directly from THE RAINBOW. We'll also send you a special reservation form so you can get your special room rate.

Come to **RAINBOWfest** . . . help us all celebrate CoCo Community at its finest.

United Airlines and THE RAINBOW have joined together to offer a special discounted fare to those attending **RAINBOWfest-Irvine**. Simply by calling United at the toll free number listed below and identifying our meeting, with account number 522-I, you will be eligible for a 20 percent discount on the Easy Saver Fare. The only requirement is a Saturday night stay.

(800) 521-4041
Account Number 522-I

Show Schedule:

Friday evening — Exhibit hall open from 7 p.m. to 10 p.m.

Saturday — Breakfast at 8 a.m. Exhibit Hall opens at 10 a.m. and closes at 6 p.m.

Sunday — Exhibit Hall open from 11 a.m. to 4 p.m.

RAINBOWfest-Irvine, California (L.A. area)

Date: February 15-17, 1985

Hotel: Irvine Marriott Hotel

Rooms: \$65 per night, single or double

Advance Ticket Deadline: February 8, 1985

RAINBOWfest-Chicago, Illinois

Date: May 17-19, 1985

Hotel: Hyatt Regency Woodfield

Rooms: \$49 per night, single or double

Advance Ticket Deadline: May 10, 1985

FREE Rainbow poster
for first 500 tickets ordered.

FREE T-Shirt to first five people
from each state who buy tickets.

Make checks payable to:
THE RAINBOW

MAIL TO:

RAINBOWfest
P.O. BOX 385
Prospect, KY 40059
(502) 228-4492

YES, I'm coming to RAINBOWfest! I want to save by buying tickets now at the special advance sale price. Send me tickets for (check one):

☐ Irvine, California ☐ Chicago, Illinois

Please send me:

_____ three day tickets at \$9 each	total _____
_____ one day tickets at \$7 each	total _____
_____ Circle one: Friday / Saturday / Sunday	
_____ Saturday breakfast tickets at \$12 each	total _____
_____ Handling Charge \$1	_____ 1.00

TOTAL ENCLOSED (U.S. FUNDS ONLY, PLEASE) \$ _____

☐ Also send me a hotel reservation card for () Irvine, or () Chicago.

NAME (please print) _____

STREET & NUMBER _____

CITY & STATE _____

TELEPHONE _____ ZIP CODE _____

COMPANY _____

Orders received less than two weeks prior to show opening will be held for you at the door.

VISA, MasterCharge, American Express accepted.

My Account # _____ Ex. Date: _____

Signature _____

Note the answer to 5+5 won't align properly, without extra work. But, statistically, it is an infrequently called problem and thus is no big deal. We won't bother programming a special alignment for it.

Obviously, now that we can get all the problems we desire, a lot of this program becomes unnecessary. We can delete Line 2000 to the end of the program. But, first, transfer Line 60000 to Line 6.

```
6 CLS:FOR I=1 TO 6:PRINT:NEXT
```

Note that we inadvertently changed the variable Y to I and 5 to 6. No harm done! We now *DEL 2000-*. We don't need Lines 4 and 5, *DEL 4-5*.

RUN. Deleting Line 5 doesn't give Line 61 anyplace to go. CoCo is mad! Change Line 61 to *GOTO* Line 6.

```
61 IF A<>Q+R THEN CLS:GOTO 6
```

Time to make two copies of work in progress. *CSAVE'ADDD'*.

```
0 '<ADDD>
6 CLS:FOR I=1 TO 6:PRINT:NEXT
7 Q=RND(5):R=RND(5)
10 PRINTTAB(15)Q
20 PRINTTAB(14)+"R
30 PRINTTAB(14)"-- ";;INPUT A
50 PRINTTAB(15)A
60 IF A=Q+R THEN X=X+1:GOSUB1000
61 IF A<>Q+R THEN CLS:GOTO6
70 GOTO 6
1000 PRINT@322,"YOU GOT"X"RIGHT
SO FAR!"
1010 PRINT:INPUT"          PRES
S <ENTER>";OA
1020 CLS
1030 RETURN
```

Note that no negative reinforcement is desired by indicating the total number of attempts or the number of incorrectly answered problems.

For variety and practice working with other combinations of numbers, Q and R may be changed in Line 7 to any values that add up to 10.

i.e. Q=1 R=9 <7 Q=1:R=RND(9)>

i.e. Q=3 R=7 <7 Q=RND(3):R=RND(7)

If Q=0 or Q=1, don't use *RND*. It is a waste of time. We change our program, with the new variables in the second example.

```
7 Q=RND(3):R=RND(7)
```

We note that Line 30 needs to be moved one space to the right.

```
30 PRINTTAB(15)"-- ";;INPUT A
```

We try to format the program to make it neat and well-centered. We move the problem up one row.

```
6 CLS:FOR I=1 TO 5:PRINT:NEXT
```

We drop the scoring line, 1000 down a row by adding +32 to 322 and then we center the line of text by moving it over +3 spaces. 322+32+3==357.

```
1000 PRINT@357,"YOU GOT"X" RIGHT SO FAR!"
```

Move Line 1001 over to the left by editing out one space after the first quotes.

It would be nice to add a bit of sound whenever the child gets a correct answer. We might as well telegraph when an incorrect answer is given. I am not sure this last is wise but for the purpose of this program, we'll include a mistake sound.

In Line 61, insert *PLAY"O1FC"* after *THEN*. Do it now. In Line 60, insert *PLAY"O3L16CEGL8O4CL16O3GL4O4C"* at the very beginning.

Make two copies of you know what, *CSAVE'ADDE'*.

In order not to add negative reinforcement, we will not show an incorrect answer in Line 50. Any of the three lines below will be OK.

```
40 IF A<>Q+R THEN 61
```

```
40 IF A<>Q+R GOTO 61
```

```
40 IF A<>Q+R THEN GOTO 61
```

You better make three copies this time, *CSAVE'ADDF'*.

```
0 '<ADDF>
6 CLS:FOR I=1 TO 5:PRINT:NEXT
7 Q=RND(3):R=RND(7)
10 PRINTTAB(15)Q
20 PRINTTAB(14)+"R
30 PRINTTAB(15)"-- ";;INPUT A
40 IF A<>Q+R GOTO 61
50 PRINTTAB(15)A
60 IF A=Q+R THEN X=X+1:GOSUB1000
61 IF A<>Q+R THEN PLAY"O1FC":CLS
:GOTO6
70 GOTO 6
1000 PLAY"O3L16CEGL8O4CL16O3GL4O
4C":PRINT@357,"YOU GOT"X"RIGHT S
O FAR!"
1010 PRINT:INPUT"          PRESS
<ENTER>";OA
1020 CLS
1030 RETURN
```

For practice, convert Lines 10; 20; 30; using *PRINT@* instead of *PRINTTAB*.

Design a neat title page. Make up an instruction panel, as simple as possible, so beginner readers can understand it. Don't forget to insert a header with your name and address. It is now your program.

The proof of the pudding is to try it out on your youngsters or neighborhood kids to see if it is effective. No program has any value, unless those for whom it is intended can run it and use it to advantage.

You are urged to pick some simple idea and create a program around it. If you can create a creditable program, after studying 11 chapters in the manual, can you imagine what fine programs you will be able to create when you master the entire manual?

Yet, the most important point to be made is to make lots of copies of your work. Erase your working programs with care. There seems to be some rule. After you erase the program, guess what you are looking for. I hope you had fun and perhaps inspiration to work up an idea this article may have suggested.

Everything You Always Wanted To Know About The Color Computer But Radio Shack Didn't Tell You

This is part four in a series of articles concerning various aspects of the Color Computer.

By Andy Kluck

This month we will examine some of the peculiarities of Disk BASIC. The use of the `&H` prefix for Hex constants and `&O` or just `&` for Octal constants is described in the Extended BASIC manual, but it doesn't tell you what you have to do to convert Hex or Octal values contained in strings to numeric variables. This can be done by adding the prefix to the string and taking the value of the result:

```
H=VAL("&H"+HS)  
O=VAL("&"+OS)
```

Concurrent Files

The Disk BASIC `OPEN` statement gives an AO Error if the specified device number is already open. In most cases it also gives this error if the same file is already open on another device number. However, an exception is made if the new `OPEN` statement uses the same access mode, either input or random (direct), as the file was previously opened with. This apparently intentional loophole allows a file to be opened and accessed through two or more device numbers at the same time as long as all

`OPEN` statements use the same mode, input or random. This could be useful if you need to access two parts of a file at the same time.

COPY

For some strange reason, `COPY` is listed in a section of the Disk manual entitled "Special Multi-Drive Commands." This seems unfortunate, since such a command is the only efficient way to duplicate binary and data files. However, the `COPY` routine actually has a special provision for copying with one drive. If `COPY` is used with only one filename: `COPY "FILENAME/EXT"` instead of the syntax suggested in the Disk manual, the computer will request the user to switch disks as many times as necessary to copy the file. According to the "Disk BASIC Summary" in the back of the manual, executing `COPY` will "erase memory." This is misleading. Unlike `BACKUP` and `DSKINI`, `COPY` uses only the area of free memory between the array variables and the stack for its data storage. `COPY` does not clear variables, and it may be used within a program. There is one problem with `COPY`, either with one or two drives; because of a bug in `CLOSE`, with either Disk BASIC 1.0 or 1.1, an I/O Error in `COPY` can cause a system crash.

(Andy Kluck is an electrical engineering student at the University of Texas at Austin.)

DIR

Disk BASIC does not support listing of a diskette's directory to the printer; however, this can be done by setting the device number at \$6F to -2 and then calling the directory routine:

```
POKE 111,254:DIR
```

The two instructions should not be separated, and if executed within a program should be followed by:

```
POKE 111,0
```

to redirect output to device 0.

RUN

The statement `100 RUN A$(X)` might

be useful in a menu program. However, it doesn't work because Disk BASIC assumes that if the first character of whatever follows `RUN` isn't a quote, then it is a line number. The problem may be solved by adding an empty string: `100 RUN ""+A$(X)`

VERIFY

According to the Disk BASIC manual, *VERIFY ON* causes a VF Error if a sector is written incorrectly. Actually, the routine that handles the verifying does more than this. When it detects that a sector has been written in error, it does not simply give a VF Error and give up; instead it attempts to write the sector up to four more times before it gives the error. So disk BASIC with

VERIFY ON does not just tell you when it has glitched your directory; it often can repair it immediately without you or your application program knowing what happened. Incidentally, if you get I/O Errors reading disks made without *VERIFY ON*, try: `? PEEK(&HF0)` after the errors. If you get an eight or 16, there's a good chance that *VERIFY ON* would have prevented the error. Unless your drive has a better than average reliability record, I recommend *VERIFY ON* at all times except for *BACKUPS*, which take a long, long time with verify. Instead, a fast disk scanner may be used to test the destination disk after *BACKUP*. For example, this BASIC program can usually test a disk in about 15 seconds if there are no errors.

The listing:

```
10 FOR A=&H10A TO &H1FB: READ I#
: V=VAL("&H"+I#):S=S+V: POKE A,V
: NEXT
20 IF B<>4040 THEN PRINT"DATA ER
ROR": STOP
30 S=1
40 FOR N=1 TO 8
50 FOR A=&H1FA TO &H20B
60 READ I
70 POKE A,I
80 NEXT A
90 NEXT N
100 POKE &HEA,2 ' READ SECTORB
110 POKE &HEB,0 ' DRIVE 0
120 POKE &HEE,4: POKE &HEF,0
130 FOR TR=0 TO 34
140 POKE &HEC,TR
```

```
150 EXEC &H10A ' READ TRACK
160 IF PEEK(&H1F9)=0 THEN 240
170 FOR A=&H1FA TO &H20B
180 SE=PEEK(A)
190 E=PEEK(A+18)
200 IF E=0 THEN 230
210 ER=ER+1
220 PRINT "ERROR";E;"ON TRACK";T
R;"SECTOR";SE
230 NEXT A
240 NEXT TR
250 PRINT ER;"TOTAL ERRORS."
260 DATA 7F,01,F9,8E,01,FA,A6,80
270 DATA 97,E0,A0,9F,C0,04,96,F0
280 DATA A7,88,11,8A,01,F9,87,01
290 DATA F9,8C,02,0C,26,E8,39
300 DATA 1,12,5,16,9,2,13,6,17
310 DATA 10,3,14,7,18,11,4,15,8
320 DATA 1,5,9,13,17,3,7,11,15
330 DATA 12,16,2,6,10,14,18,4,8
```

The program assumes that the disk was formatted with a skip factor of four and attempts to read each track in one revolution of the disk. In some cases, however, depending on the current drive speed, the speed at which the disk was formatted, and the speed at which the sectors were written, the end of one sector comes too close to the beginning of the next sector. This results in much slower operation. If the program runs slower than about 2.5 tracks per second on some disks, replace Line 30 with:

```
30 S=2
```

With this setting the program will read every other sector and take two revolutions to read each track by using the sector order of Lines 320 and 330 instead of Lines 300 and 310. Finally, in order to implement *VERIFY ON* in

some software packages it may be necessary to insert the *VERIFY* statement into the program; for example, with the *Telewriter*, add the line:

```
0 VERIFY ON
```

to the program: `S/XXX`.

CLOSE

There are several problems in the part of the *CLOSE* routine in the Disk BASIC 1.0 ROM used with random (direct) access. A misdirected branch at `$CACC` causes some strings fielded in buffers other than the one being closed to be deleted. Also, because of a stack mess up, any string array elements fielded in any buffer can cause unexpected results. Most importantly, whenever a random file other than the last one opened is closed, the system crashes. Therefore, if

you must have two or more random files open at once, open them in ascending order and close them in descending order by device number. Remember that whenever an error occurs, files are closed in descending order. A similar problem may occur in *COPY* — if an I/O Error occurs while one of the files is open, *CLOSE* gets confused and causes the same crash. While the first three problems are fixed in the 1.1 Disk ROM, the last one is not.

The Case Of The Garbled Up Disk

Radio Shack devotes a whole chapter to the garbled up disks, but they omit some of the common causes of disk garbling. Starting at address \$800 there are four areas used to store the file allocation table of each drive with open files. Each area also has one byte used to count the number of open files on that

HI — RESOLUTION SCREEN UTILITY

HI-RES SCREEN UTILITY
Evaluating Double Height Characters
On Screen UNDERLINE
Bell Character Tone generator
Switchable Full Screen Reverse Video
True Upper & Lower case character set
Reverse Video Highlighting
Programmable line lengths from 28 to 255 characters
28 Characters per line
32 Characters per line
36 Characters per line
40 Characters per line
44 Characters per line
48 Characters per line
Line lengths of 80, 128 & 255 are unreadable
but can be very useful for seeing display layouts
All functions are easily programmable thru BASIC
Fully BASIC COMPATIBLE including CLS & PRINT

- FULLY BASIC COMPATIBLE
- DISPLAY FORMATS OF 28 to 255 CHARACTERS PER LINE
- FULL 96 UPPER LOWER CASE CHARACTERS
- MIXED GRAPHICS & TEXT OR SEPARATE GRAPHIC & TEXT SCREENS
- INDIVIDUAL CHARACTER HIGHLIGHTING
- REVERSE CHARACTER HIGHLIGHT MODE
- WRITTEN IN FAST MACHINE LANGUAGE
- AUTOMATIC RELOCATES TO TOP OF 16 32K
- AUTOMATICALLY SUPPORTS 64K OF RAM WITH RESET CONTROL
- REVERSE SCREEN
- ON SCREEN UNDERLINE
- DOUBLE SIZE CHARACTERS
- ERASE TO END OF LINE
- ERASE TO END OF SCREEN
- HOME CURSOR
- BELL TONE CHARACTER
- HOME CURSOR & CLEAR SCREEN
- REQUIRES ONLY 2K OF RAM
- COMPATIBLE WITH ALL TAPE & DISK SYSTEMS

\$19.95



INTRODUCING TEXTPRO III

"The Professionals" Word Processing System



- 9 Hi-Resolution Display Formats: from 28 to 255 Columns by 24 lines
- True Upper/Lower Case Display
- Three Programmable Headers
- Programmable Footer
- Automatic Footnote System
- Automatic Memory Sense 16-64K
- Up to 48K of Workspace on 64K
- 10 Programmable Tab Stops
- 7 Tab Function Commands
- Automatic Justification
- On Screen Underlining and Double Size Characters
- Change Formatting at Any Time
- Edit Files Larger Than Memory
- Compatible with All Printers
- Easily Imbed Any Number of Format and Control Codes
- Typist Friendly Line and Command Format Entry
- Automatic Key Repeat

TEXTPRO III is the most advanced Text Editing and Word Processing System available for the Color Computer. One of the reasons for this is, Textpro works in a totally different way than the other Color Computer Word Processing programs. It uses simple 2 character abbreviations of words or phrases for commands. These commands are used at the beginning of a line and are preceded by a "." period. Several commands can be chained together on the same line for ease of use. Thru these commands you tell the Word Processor how you want the margins set, line length, indenting information, and so on. You can change the way you want a document formatted at any point in the document. You also have the freedom to write without worrying about how long the line is or where the margins are and so on. The Word Processor automatically takes words from one line to the next and fills out the printed line to the desired length. You can even use the command to Input Text from the Keyboard while a document is being processed, and use that information to change the formatting or enter any other valid text Processor command. With this kind of flexibility and an extensive set of commands and functions available, it's no wonder that TEXTPRO III is the most advanced Word Processing System.

Screen Formatting

Textpro III has 9 Hi-Resolution Upper/Lower case display formats available, from 28 to 255 characters per line by 24 lines. You also have advanced screen commands such as double size characters and on screen underlining. You can also use the standard 32 by 16 display for systems having lower case hardware kits installed. The display defaults to a 51 by 24 format that is easily switched to any other format available. Along with the Hi-Resolution screen we added automatic repeating keys "Typomatic." The rate is fully adjustable from nil in last to super slow it can be turned off entirely for your convenience.

64K Support

Textpro III fully supports the use of 64K on the Color Computer. It has lost automatic memory sensing and configures itself accordingly. Textpro III does not require Extended Basic or Flex to take full advantage of a 64K RAM system. On a 64K Disk System there is over 64K of workspace available and files larger than memory are fully supported. Tape based systems have up to 48K available for workspace.

Text Editor

Textpro III has a full featured, line oriented screen editor. It supports single or multiple line copy and move, global or local search and replace of any character string, character insert and delete, block delete, adjustable speed automatic key repeat, single and automatic line edit, programmable underline and double width font of coded, change screen background color and line lengths, automatic line numbering, line resequence, and insert and delete line numbers.

Disk & Tape I/O

Textpro III uses fully compatible ASCII formatted files that do not have to be converted like some of the other Word Processing Systems. It will load, save and verify basic ASCII formatted tape files. The disk version supports Load, Save, Directory, Kill, Append, Text Process file from Disk, Roll part of file to disk and get next portion of file from disk.

DISK \$59.95

TAPE \$49.95

Standard Commands

Textpro III learns a whole host of Document Formatting commands. The setup command section includes: Line Length, Top, Left, and Bottom Margins, Page Length, Page Numbering on/off and Automatic Word Fill and Justification on/off.

Some of the vertical control features include: test for number of lines left on the page, skip to next page, set page number, wait at top of page, single and multi line spacing, and skip blank lines.

Textpro III learns 3 programmable header lines that can be centered, left or right justified. It also has one programmable footer line. 3 commands for continues, single and paragraph indenting, center text, underline and double width print commands.

Footnotes and Special Commands

Some of the special features allow imbedded control codes to access intelligent printer features like: superscript, subscript, change type font and even graphics. You can even imbed control codes within justified text. There is a command that automatically places footnotes at the bottom of the page, which can be very handy for term papers, etc. Another command allows you to display a message on the screen and input text from the keyboard. This text is then printed as if it has been part of the original text, thus you can produce things like a personalized form letter. There is also a repeat command that allows you to repeat an entire document or a part of one as many times as needed up to 255 times. This can be used to produce mailing labels or combined with the previous command to produce a selected number of personalized form letters.

Tab Functions

Textpro III learns an elaborate system of tab commands for complete control over column formatting. There are 10 programmable tab stops that can be defined or re-defined at anytime in the text file. They can be used with the following tab commands: Center Over Tab Column, Right Justify to Tab Column, Decimal Align Over Tab Column, Left Justify to Tab Column (Normal Tab) and Horizontal Tab. Tab functions may also be used with a numeric tab column position for maximum flexibility. You can also define the Tab Fill Character to any printable character to fill in the blanks with dots, dashes, etc.

5566 Ricochet Avenue
Las Vegas, Nevada 89110

**CER
COMP**
(702) 452-0632

All Orders Shipped From Stock
Add \$2.50 Postage

drive, and one byte that counts changes in the *FAT* and indicates whether the table should be written out when a file on that disk is closed. Any loading of garbage into this area is likely to mess up these bytes such that the next time a file on the disk is closed, the garbage is written out to the disk's *FAT* sector, which is essential to accessing the files. For example, many programs designed for cassette systems load starting at \$600. If one of these were converted to a disk file with a tape to disk program, a likely result of attempting to load it would be not just a crashed BASIC but also an unusable disk. A similar problem could occur if the program was loaded from a cassette and an attempt was made to save it on a disk. This is also what can happen if you use a certain often-published *PCLEAR 0* routine and try to *LOAD* a BASIC program. While these situations all arise out of user error in messing with BASIC's reserved areas, a similar problem can be caused by another of the bugs in Disk BASIC 1.0. Whenever the *File Allocation Table* is written out on the disk (during *CLOSE*, *KILL*, *WRITE*, etc.) the "number of open files" counter for the next higher numbered drive is set to zero by a botched instruction at \$C70C. Because of this, any changes in the *FAT* made on a disk in one drive (due to *CLOSE*, *KILL*, etc.) while files are open on the next higher drive, can result in the file counter of the higher drive being decremented to a non-zero number when the files on it are closed. If this happens, any disk later placed in the higher numbered drive may be wrecked by having its *File Allocation Table* overwritten by a copy of the *FAT* from another disk. For example, if you open a file on drive 1, *SAVE* or *KILL* on drive 0, *CLOSE* all files or *UNLOAD 1*, switch disks in drive 1, and *SAVE* on drive 1, the new disk may get the *FAT* copied from the old one and require reconstruction ef-

forts to recover files. This does not apply in a one-drive system, but if you're going to *OPEN* any files on any drive except 0, and work with other drives while they're open, I recommend using Disk BASIC 1.1, in RAM if necessary, to avoid this problem.

UNLOAD And END

The Disk BASIC manual cautions that you should use *UNLOAD* before switching disks whenever there may be files open. But all *UNLOAD* does is close all files on the specified or default drive. So unless you want to leave files on some drives open, you can save keystrokes by using *END*, which closes all disk and cassette files, or any syntax error, as the Disk BASIC error routine closes all disk files. Note also that *UNLOAD* closes files from low to high device numbers, the opposite order from *CLOSE*, so *UNLOAD* can trigger the random files crash in the 1.0 Disk ROM.

64K

As you probably know, the Radio Shack 32K CoCo contains 64K RAM chips, and with a hardware modification first published by Frank Hogg in February of '82 and eventually adopted by Radio Shack for use in the current revision circuit boards, the full 64K can be accessed through memory paging. One way to use this extra memory is to run a program like:

```
10 FOR I=0 TO 22
20 READ X: POKE 950+I,X
30 NEXT I
40 EXEC 950
50 DATA 26,80,142,128,0,183
60 DATA 255,222,236,132,183,255
70 DATA 223,237,129,140,255,0
80 DATA 38,241,28,175,57
```

to copy the BASIC interpreters into the upper half of RAM and leave the SAM in map type one so that BASIC may be

modified and the area above BASIC may be used as extra RAM. Many people have assumed that without the modification, which prevents a bus conflict problem during write operations, or the new board, none of the extra memory may be accessed. It appears, however, that even without the modification there should be no problem writing at addresses that would be unoccupied by ROM in map type zero, or even at addresses that would contain ROM as long as the data to be written is copied directly from the ROM, avoiding the bus conflict. This means that even in the older, unmodified 32K units, about 16K of free memory in the range of \$C000-\$FEFF may be easily accessed if a disk controller or ROM cartridge is not in the system by simply running the above program. After running this program, the system is actually in the 64K mode, although without the modification the 16K from \$8000-\$BFFF is unable to reliably store anything other than an exact copy of the ROM, so it's really more of a 48K computer. I have seen several articles regarding the process of relocating ROM packs to run in low RAM, but this seems hardly worth the effort when you can load the programs in RAM from tape and run them at the address they were designed for without breaking your warranty seal to effect a true 64K computer. There is also another use for this mode; if even Extended BASIC is not in the system, it can be loaded from tape and *EXECed*. To make the tape:

```
CSAVEM "XBASIC", &H8000,
&H9FFF, &H8002
```

Remember that pressing Reset sets the SAM back to map type zero, the ROM mode, and makes the RAM above 32K disappear; also, the high speed (address dependent) mode will not work in map type one.



BRITISH COLUMBIA

For all your COCO Software
write or call:

"The USER-FRIENDLY Company"



DATAFACT SOFTWARE LTD.

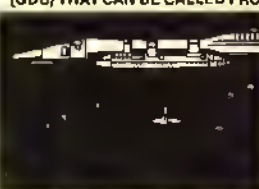


PO Box 5356 Stn. B Victoria, B.C. V8R 6S4
(604) 595-2312

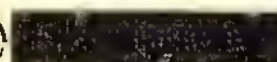
GRAPHICS COMPRESSION

GRAPHICS COMPRESSION UTILITY (GCU)

DOUBLE OR TRIPLE THE AMOUNT OF GRAPHICS THAT YOU CAN STORE IN RAM OR DISK. INSTANTLY DECOMPRESS YOUR GRAPHICS FOR HI RES DISPLAY WITH THE RELOCATABLE MACHINE CODE "GRAPHICS DECOMPRESSION UTILITY" (GDU) THAT CAN BE CALLED FROM BASIC. ALL MACHINE CODE, MENU DRIVEN



AND USER FRIENDLY. USE THE RELOCATABLE COMPRESSED GRAPHICS FOR EITHER DISK OR TAPE ORIENTED PROGRAMS. 32K, DISK & ECB REQUIRED FOR ROM CALLS. \$27.95 + \$3 S&H VARIES WITH COMPLEXITY



6144 bytes COMPRESSED TO 1542 bytes
LPSEYMOURSVS937 FAIRWOOD AVE SUNNYVALE CA 94089. Purchasing "GCU" grants you license to use "GDU" for any purpose

WHERE'S-IT

by C.E. Laidlaw

What programs are on this disk? Which disk is my WIDGET program? WHERE'S-IT will answer these questions for you and maintain disk directory index files with up to 972 programs in each. Completely user-friendly, just run WHERE'S-IT and follow the prompts to: Create index files holding up to 972 programs

Load or save existing index files

Add, delete or update index files for a specific disk

Sort index files alphabetically with a machine language sort

List index files to screen

Print index out with 162 programs to the page

Disk only.....\$19.95
(32K Extended Color BASIC)

We are also a dealer for the following companies:

Moreton Bay Software
Computerware
Spectrum Projects
Mark Data, Amdek, Epson
Pal Creations, Tom Mix
PBH Computer, Inc.
Spectral Associates,
Cognitec, Elite Software
Prickly Pear, Bolek
Cobra Software
and many more fine companies

JARB

SOFTWARE
HARDWARE

1638 D Avenue, Suite C
National City, CA 92050

After hours:

BBS 619-474-8981

Orderline:

818-474-8882

T.A.G. THE ADVENTURE GENERATOR

ADVENTURE

Cassette.....\$34.95
Disk/Amdisk.....\$39.95



FEATURES

- Creates stand-alone programs
- Up to 100 rooms, 60 objects, 30 command words, and 9 conditional flags
- Supports tape and disk output
- Optional printer output of important sections during creation of ADVENTURE
- Complete documentation
- Includes sample ADVENTURE
- Works with all models of the CoCo except MC-10
- Requires 32K Extended Color BASIC

NEW GRAY LADY

by Terry A. Steen

Control your submarine in its efforts to destroy the enemy fleet. You must launch your sub to surface missiles while avoiding the depth charges. Five different types, hi-res graphics and spectacular sounds. Also a talking version included at no extra charge for those who have an SC01 based voice pack. Four screens and progressive difficulty make this all machine language program a real bargain.

Cassette: \$19.95

Disk/Amdisk: \$24.95

U.S. COD orders accepted, no charge cards please.
Shipping and handling \$3.00
California residents please add 6% sales tax

JINFILE

A Jumbo With Some Very

JINFILE is a special purpose filing program designed to create, save and retrieve very long file entries. Unlike many database managers, every search can be completely different from the last, and you don't have to plan the searches when you create your data file. Besides this, it is simple and safe to operate: in a year of frequent use by a non-programmer there has not been a significant system or user-caused data loss. It requires a 32K Extended BASIC Color Computer, one disk drive and a printer.

The file structure is based on random access records which hold up to 1.5K of information on each entry. Records are stored in one of four compatible categories, and

depending on the category, may contain up to 17 elements of varying lengths. Table 1 describes the categories, their associated elements and the length of each element. Once created, the records are retrieved by either calling a specific entry by number or describing the type of information desired, and letting the program search for all of the records fitting your description.

The four categories available reflect the original purpose of JINFILE — to support research in art history. However, it is easy to change these to suit your own needs. The arrays are described in Tables 1 and 2. Lines 400 and 1600 define the four acceptable category codes, and the lead items in

Table 1: RECORD DESCRIPTIONS

NR	LENGTH	BIBLIOGRAPHY	PEOPLE	STRUCTURES	ARTWORK
0	na	Record	Record	Record	Record
1	2	Category	Category	Category	Category
2	250	Subject	Subject	Subject	Subject
3	250	Author	Name	Architect	Artist
4	115	Title	Address	Building Name	Artwork Title
5	50	Journal	Position	Type(Style)	Country
6	32	Place of Pub.	-	Drawings-Institut.	-
7	32	Pages/Publisher	-	Height	Dimensions
8	12	Date	Date	Date	Date
9	10	Volume	Nationality	Material	Medium
10	30	Illustrations	-	Drawings-City	-
11	30	Location	Institution	Location	Location
12	20	Call Number	Phone Number	File Number	File Number
13	8	Notes/Course	Notes	Notes/Slides	Notes/Slides
14	25	Value(Year)	-	Drawings/Type	Drawings/Type
15	220	Comments(1)	Comments(1)	Comments(1)	Comments(1)
16	220	Comments(2)	Comments(2)	Comments(2)	Comments(2)
17	220	Comments(3)	Comments(3)	Comments(3)	Comments(3)

(Bob Weir is a graduate student in computer science at the University of North Carolina, Chapel Hill.)

Information File Handler

Special Features

By Robert Weir

data Lines 2010, 2020, 2030 and 2040 provide their names. Element names can be altered by changing data Lines 2005 to 2060. Be sure the sum of the *LN* values does not exceed the value specified in the *FILES* statement in Line 50. If you modify *JINFILE*, it is a good idea to plan your alterations using tables similar to Tables 1 and 2.

After you have *JINFILE* saved on disk, you can run it just like any other BASIC program — type *RUN "JINFILE"* and it will load and execute. Once the program is loaded into memory, the program disk is not required, and you can leave your data disk in for the entire work session. As a safety feature, *JINFILE* closes disk files immediately after reading

or writing a record. This means that you can end the program at any time the disk light is not lit simply by pressing *BREAK*. It may not be the most elegant way to end, but you don't have to worry about losing data unintentionally.

When the program is run, you first see the main menu (Table 3). You can select the desired command by simply pressing the indicated key.

Data Input

Input is selected from the main menu by pressing 'D'. You will be asked for the disk number. This is for your reference primarily, and can be anything you choose as long as it is a

Table 2: MATRIX LISTINGS

Matrix *NM\$(3,17)* which provides element names and matrix *LN(17)* which provides element lengths are contained in Table 1.

PX (3, 17) : Provides ordered values for data input or printing.

Symbol	B	P	S	A
X	0	1	2	3
Y				
0:	0	0	0	0
1:	1	1	1	1
2:	2	2	2	2
3:	3	3	3	3
4:	4	4	4	4
5:	5	11	5	9
6:	6	12	8	8
7:	7	5	9	11
8:	8	9	7	5
9:	9	8	11	7
10:	10	13	6	12
11:	11	15	14	13
12:	12	16	10	14
13:	13	17	12	15
14:	14	-1	13	16
15:	15	-1	15	17
16:	16	-1	16	-1
17:	17	-1	17	-1

PP (6) : Provides reference start positions for the PS array pages. Last value is dummy.

PAGE:	0	1	2	3	4	5	6
	0	10	17	20	24	26	27

number. Next you will enter your two-letter category/subcategory code. The category is indicated by one of the letters 'B', 'P', 'S', or 'A' corresponding to the first letter of each category name. Subcategory is a different matter. It is mainly designed for future implementation of a disk record directory, and can now be any printable character you desire. The recommended use of subcategory is to cover very broad areas that span the range of categories. Examples are Crafts, Course references, Canadian Arts and Architecture.

After that, each element will be requested with a special screen display to assist in keeping the element length within the allowable limits. If you do enter one that's too long, then one of two things will happen. If it is a long entry, then the overlength end will be chopped off, and you'll be informed. If it is a short entry, then the entire element is erased and you must redo it.

When entering data, provide the information requested in any format that you are comfortable with. For example, under Subject, list in any order all of the subjects you might want to find the record by. It is not necessary to separate each item, but commas help readability. If you use abbreviations, be very careful because consistency is the key to having successful searches. Experienced *JINFILE* users keep a summary sheet of most often used abbreviations handy.

Ideally, subjects should be chosen in a manner resembling the waterfall technique used in building outlines. This will allow successful searches at various different levels of detail. It is highly recommended that you never use lowercase letters. The program is not sophisticated enough to tell that "CRAFTS" is the same as "Crafts." Consequently, you can

see that searches might fail for no other reason than an injudicious use of lowercase letters.

You do not have to enter anything for elements that do not apply. Simply press ENTER and the phrase "NO ENTRY" will be inserted in that element for you.

When all elements have been entered, a new menu will appear, offering you the following choices:

- S Save file on disk
- R Review entry
- X Finished data entry
- N Input new entry

Selecting Review will allow you to edit the record before it is saved to disk. After editing, the above menu will return. You should then select Save before adding the next record. 'N' will return you to the start of Data Input and 'X' will return you to the main menu.

Searching For Records

There are two very different ways to retrieve a record that has been saved on disk. The quickest way can be used when you know exactly which record you want. The other method, searching with definitions, takes considerably longer, but this is the way to gather all of the information that has been saved on a particular range of subjects.

To conduct a record search, insert the data disk that contains the desired record when the main menu appears. Then select 'R' at the main menu. The screen will clear, and you will be asked to provide the desired record number. This number can be the complete record number, or just the last three digits of the number. The program does not care if you

Table 3: MAIN MENU

```
JINFILE V1.1
MASTER FILING SYSTEM

INSERT DATA DISK, PRESS <ENTER> WHEN READY?

KEY RETRIEVAL MODE

D  DATA INPUT
R  RECORD SEARCH
S  SEARCH WITH DEFINITIONS
P  SEARCH WITH PRIOR
   DEFINITIONS
```


call for record 4003, 3, or even 6003. It is only interested in which record to look for on the disk currently in the drive, and that information is provided by the 3.

When you have provided the record number (followed by ENTER), it will commence a search on the disk. If the record cannot be found, then an error message will be displayed. This will say:

IMPROPER ENTRY, (nbr) REDO

The number provided will be the number you entered. This error will generally occur only when you ask for a number larger than the largest entry presently on the disk. It will also occur if you specify a number less than one.

When the record has been found, display page 0 will appear, and all of the display, print and editing functions are then available. Press 'X' when you are finished with the record, and you will be asked if you want another record. Answer "NO" to return to main menu.

When you want to conduct a descriptive search, then think in threes. You can search any three lines of your 17-line record for the occurrence of up to three sets of three key phrases. Naturally, these are upper limits, and you can choose to search only one line for one specific word.

Select 'S' at the main menu for a descriptive search. You will be asked for the category and subcategory to be searched. The whole entry is a two-letter specification followed by ENTER. If, for example, you are only interested in printed materials, then the category will be 'B'. If you wish for more than one category to be searched, then enter 'X'. Subcategory works the same way, and this will generally be 'X'.

You will then be asked to specify each exclusive group. These groups are up to three phrases long. You can specify "Italian Architecture," "Dutch Painting," and "Oil" as one exclusive group.

If you have less than three phrases for a group, then just press the ENTER key when an input is called for. The same technique is used if there are less than three exclusive groups — just press ENTER when the first element of the group is called. When your parameters have all been entered, the printer will provide a hard copy of your entry.

The last specifications are the line numbers to search. They are input in the same way as above. Key in each number, followed by ENTER. Typically, searches are conducted in the three lines containing the most information — namely 2 (Subject), 3 (Author), and 4 (Title). The comment lines are also useful to look at, depending on how you have saved your information.

The search will then begin at the first record on the disk. As each successful match is found, it will be displayed on the screen, and all of the normal options to print, display or edit are available. To continue the search, press 'X'. Once the last record on the disk has been reviewed by the program, the main menu will reappear. If you have other disks to search, you should then insert the next disk, and press the 'P' key at the main menu. This will continue the search without the necessity to re-enter the search parameters. Press 'Z' to abort the search and return to main menu.

When choosing parameters to search with, you must carefully evaluate just what you want to see. First, decide how many exclusive groups you wish to use (up to three). Often you will only use one, since these groups are *ANDed* in the

Table 4: SEARCH WORKSHEET

Date: _____

Category/Subcategory: _____ / _____ (2 characters; XX for all)

Exclusive Group 1:

(a) _____

OR (b) _____

OR (c) _____

AND Exclusive Group 2:

(a) _____

OR (b) _____

OR (c) _____

AND Exclusive Group 3:

(a) _____

OR (b) _____

OR (c) _____

Lines to Search: _____ / _____ / _____

program, which means that in order to retrieve a record, a match *must* be found in each of the groups. For example, if you want to find every record that contains *both* Architecture and Crafts, you would use two exclusive groups. A record that contained only Architecture would not be retrieved.

There will be many times when you wish to see records that contain references to more than one item. For instance, you might want to see all of the references to Dutch Painting as well as anything that discusses Rubens. These parameters would go into a single exclusive group.

If you take these different parameters all together and put them into a matrix, the result will appear as follows:

parameter 1 OR parameter 2 OR parameter 3
AND
Parameter 4 OR parameter 5 OR parameter 6
AND
Parameter 7 OR parameter 8 OR parameter 9

You can fill this matrix up however you wish, just remember that each exclusive group you use will need to be satisfied before a record is retrieved and displayed. Table 4 provides a worksheet to assist in defining your search.

Display Options

There are a total of six different display pages: 0 to 5. They can be selected at any time and in any order so long as one of the six is presently visible on the screen. Their purpose is to allow you to quickly and efficiently review any part of a record.

There are two points in the program where you have a

chance to look at the data file which is currently in memory. The first point is after you have completed entering or correcting a record and are ready to save it on the disk. The other point is when a search has retrieved a record from the disk. You will be able to recognize these times by the display shown. That display is a summary of the most important elements of the record, and is called page 0. It contains the following elements either in whole or in part:

Page 0: (The entries are in Bibliography : People : Structures : Artwork order)

(0) RECORD

(1) CATEGORY

(2) SUBJECT (part)

(3) AUTHOR : NAME : ARCHITECT : ARTIST (part)

(4) TITLE : ADDRESS : BUILDING NAME :

ARTWORK TITLE (part)

(5) JOURNAL : POSITION : TYPE(STYLE) :

COUNTRY

(10) ILLUSTRATIONS : — : DRAWINGS-CITY : —

(9) VOLUME : NATIONALITY : MATERIAL :

MEDIUM

(13) NOTES/ COURSE : NOTES : NOTES/SLIDES :

NOTES/SLIDES

(12) CALL NBR : PHONE NUMBER : FILE NUMBER
: FILE NUMBER

The purpose of page 0 is to put as much information as possible on the screen at one time, and to allow you to make a quick decision as to the next step.

Pages 1 to 5 provide the complete record, and are useful

PS (1, 26) : Provides element numbers and corresponding screen print positions for page displays.

Item	Line Nbr		Position
	X	0	1
	Y		
PAGE 0:	1		15
"0"	1:	2	32
	2:	3	128
	3:	4	192
	4:	5	256
	5:	10	320
	6:	9	384
	7:	8	416
	8:	13	448
	9:	12	480
PAGE 10:	1		15
"1"	11:	2	32
	12:	11	320
	13:	12	384
	14:	13	416
	15:	8	448
	16:	9	480
PAGE 17:	3		0
"2"	18:	4	288
	19:	5	416
PAGE 20:	7		0
"3"	21:	14	96
	22:	6	192
	23:	10	288
PAGE 24:	15		0
"4"	25:	16	256
PAGE 26:	17		0
"5"			

for proofreading a data entry or assisting you in your decision to print a record found during searches. They contain:

Page 1:

- (0) RECORD
- (1) CATEGORY
- (2) SUBJECT
- (11) LOCATION : INSTITUTION : LOCATION :
LOCATION
- (12) CALL NUMBER : PHONE NUMBER : FILE
NUMBER : FILE NUMBER
- (13) NOTES/COURSE : NOTES : NOTES/SLIDES :
NOTES/SLIDES
- (8) DATE
- (9) VOLUME : NATIONALITY : MATERIAL :
MEDIUM

Page 2:

- (3) AUTHOR : NAME : ARCHITECT : ARTIST
- (4) TITLE : ADDRESS : BUILDING NAME : ART-
WORK TITLE
- (5) JOURNAL : POSITION : TYPE(STYLE) :
COUNTRY

Page 3:

- (7) PAGES/PUBLISHER : — : HEIGHT :
DIMENSIONS
- (14) VALUE(YEAR) : — : DRAWINGS(TYPE) :
DRAWINGS(TYPE)
- (6) PLACE OF PUB. : — : DRAWINGS-INSTIT. : —
- (10) ILLUSTRATIONS : — : DRAWINGS-CITY : —

Page 4:

- (15) COMMENTS(1)
- (16) COMMENTS(2)

Page 5:

- (17) COMMENTS(3)

To use these displays, all you have to do is press the number key for the page desired, and it will instantly appear. Remember that you can only do this when one of the pages is visible on the screen. You should also note that after printing a record you are returned to this display mode, since there are many other commands available besides page displays. Table 5, Page Display Commands, provides a summary of them.

Print Options

Print options, of which there are three, can be selected when you are in the display mode. Display mode is achieved automatically when you select "Review" after entering or editing a record or when the program has found a record during a search.

The three options are for either:

- a) the complete record
- b) a summary of the record
- c) a tailored printout of the elements you desire in the order that you want to see them

Print options are selected in the same way as display options. When any page (0-6) is visible, press the appropriate key from Table 5. You will then be asked to prepare the printer and paper.

Table 5: PAGE DISPLAY COMMANDS

Various commands are available, unseen, when you have one of the page displays (0-5) on the screen. Most are discussed in detail in their respective sections, but this is a comprehensive summary. To use any of them, merely press the key indicated. Pressing any key not listed here will have no effect on the program. The exception is <BREAK> - do NOT press that key unless you intend to end the program.

- 0 Display summary page 0
- 1 Display page 1
- 2 Display page 2
- 3 Display page 3
- 4 Display page 4
- 5 Display page 5
- A Print the entire record
- S Print summary of the record
- T Print record using tailored format
- D Define the format for tailored printing
- E Edit the record
- X Finished with the record; allow new (or edited) record to be saved or continue search
- Z Abort this entry and return to main menu. In Search mode, the search will be terminated, but definitions will not be lost, nor will files on disk be altered. Not available in Data Entry Mode.

Select a complete copy of your record by pressing 'A'. Press 'S' for a Summary of the Record. The following will be printed:

- 0) RECORD
- 1) CATEGORY
- 2) SUBJECT
- 3) AUTHOR : NAME : ARCHITECT : ARTIST
- 4) TITLE : ADDRESS : BUILDING NAME :
ARTWORK TITLE

A tailored printout of the Record is obtained by pressing 'T'. You must have previously defined the elements you want for this option to actually get you anything.

Tailoring is defined at the same point in the program as other print and display options are selected. Once you have specified a definition, it will be saved in memory (not on disk) until you either redefine it or end the program.

To select this option, press 'D'. At the bottom of the screen you will see displayed:

"ENTER YOUR ELEMENT NUMBERS IN THE ORDER YOU WANT THEM PRINTED. ENTER A NEGATIVE NUMBER TO END THE LIST (RANGE 0 TO 17)"

Using Table 2, select the element numbers you desire to have printed, and then type in each one, *in the order you want them printed*. You must press ENTER after each number is entered. To conclude the list, type in "-1" or any number less than 0. The display for page 0 will then reappear, and you can select any of the regular options.

Text Editing

Sooner or later, you are going to make a mistake. Even if it's later, you may still want to enter revisions to record entries. As you will see, this is very easily done either from the data input mode or the search mode.


The technique used is a simplified version of the text editor available from Extended Color BASIC. The following commands are available:

- C Change a character
- D Delete a character
- I Insert characters
- H Hack off the rest of the line and allow additions
- S Search for the first occurrence of the character
- Right Arrow or Space Bar Move the cursor one space to the right
- Left Arrow Move the cursor one space to the left
- Enter (1) Concludes Insert and Hack and, (2) Completes Editing

To use the editor, you must first get to the editing mode. This is reached from the page displays by typing 'E'. The screen will clear and you will be asked for the line number (from Table 1) which will be edited. As a reminder, you will also be given the record number being modified.

Select the line number you wish to change, type it in and press ENTER. The screen will clear again and will show the original, unchanged line near the top. At about the center of the screen, on the lefthand side, you will see a black rectangle. This is your cursor, and it always sits on top of the current character being worked on. You will only be able to

WORKBASE



SALES OR CLIENT PROFILE

INVENTORIES

MAILING LISTS

LEDGERS

STUDENT OR PERSONNEL RECORDS

APPOINTMENT SCHEDULES

ORDER ENTRY

REAL ESTATE LISTINGS

PROPERTY RENTALS

THE DATABASE SYSTEM DESIGNED FOR BUSINESS

CAN YOUR DATA BASE REMEMBER HOW YOU DID IT, LAST TIME?

CAN YOUR SECRETARY RUN REPORTS AND POST TRANSACTIONS USING YOUR DATABASE?

CAN YOU DEFINE AND SAVE REPORTS AND CALCULATIONS WITH RECORD SELECTION & SORT PARAMETERS?

IS YOUR DATABASE ALL-IN-ONE INTEGRATED PACKAGE?

CAN YOU PRINT INVOICES AND STATEMENTS?

CAN YOU PRINT TRANSACTION SUMMARIES BY ACCOUNT?

CAN YOU SELECT, SORT, & PRINT FORM LETTERS & LABELS IN ONE OPERATION?

NEW!! FROM THE CREATORS OF HOMEBASE!!
ALL-IN-ONE INTEGRATED PACKAGE: DATABASE, SPREADSHEET, WORD PROCESSING & MAILMERGE
INTRODUCTORY PRICES: WORKBASE I \$64.95 400 RECORDS — WORKBASE II \$79.95 1200 RECORDS
CALL TOLL FREE: 1-800-334-0854 (EXT 887)
OR SEND CHECK OR MONEY ORDER TO:
WORKBASE DATA SYSTEMS
P.O. BOX 3448, DURHAM, NC 27702

see that part of the entry to the left of the cursor. You can use the Right Arrow or Space Bar to move the cursor to the right. The Left Arrow backspaces. By typing 'C' followed by a letter, you can change the character underneath the cursor. If you type 'S' followed by a letter, the cursor will go to the first place that character appears to the right of the cursor. If the character does not appear, the cursor goes to the end of the line.

Insert and Hack are somewhat different in use. They use the BASIC *LINE INPUT* command, and so you will see your black cursor, as well as the BASIC flashing cursor. The black cursor is the position where your new entry starts!

So, in order to insert some new text in the middle of an

entry, press 'I'. You will see the flashing cursor appear, and you can type in the new text. You end the Insert by pressing ENTER. Hack works in the same way, except that everything from the cursor to the end of the element is deleted, and your new text is added on the end.

When you have completed your changes, press ENTER and a new screen will appear. If your entry was modified to be longer than allowable, then it will be shortened to fit automatically.

Upon completion of editing, the screen will allow you the same options that are available upon completion of a record entry, so you can choose to review, save, or erase your edited record.

160.....	221	1100	127
340.....	88	1240	245
540.....	213	1380	28
650.....	125	1580	96
770.....	74	2000	48
950.....	7	END	58

The listing:

```
10 'jinfile, 30 JAN 83.
11 'v1.1, 24 APR 83.
12 'R.C. WEIR
13 'N-14 COLONY APTS.
14 'EPHESUS CHURCH RD.
15 'CHAPEL HILL, NC 27514
20 CLEAR 5000:CLS
```

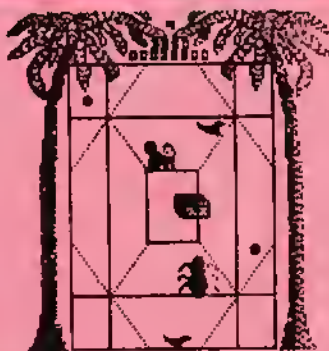
30 PRINT#10,"jinfile v1.1
BY robert weir, JANUARY 1983"

```
50 FILES 1, 1570
60 DIM LN(17),N$(17),NM$(3,17),L
ST$(2,2),FL(2),TL(17),PS(1,26),P
P(6),PX(3,17)
67 FOR X=0 TO 17
69 READ LN(X):NEXT
73 FOR X=0 TO 3
75 FOR Y=0 TO 17
77 READ NM$(X,Y)
79 NEXT Y,X
81 FOR X=0 TO 3:FOR Y=0 TO 17:READ PX
(X,Y):NEXT Y,X
83 FOR X=0 TO 1:FOR Y=0 TO 26:RE
```

Megamunk

100% machine language test action game. As a soldier / monkey you must save the forest of Ledonia from the evil memmoth spiders, avoid the falling coconuts, save the sacred birds and recover Ledonia's treasure. Megamunk has 11 different screens with multiple colors and "four voice" music. Joysticks required.

32K cassette \$21.95
32K disk \$23.95



Dog-gone it.
I wish I could play
Megamunk!

METABOT

100% machine language strategy game. You are surrounded by Metabots. Each time you take a step, they each take a step. You must lure them into the electric fences and acid pits. Great fun for ages 8 and up. The whole family can play! Joysticks NOT required.

32K cassette \$18.95
32K disk \$20.95

THE PUZZLER will create crossword puzzles, wordsearch puzzles and word scramble puzzles. It will printout the puzzle to any dot addressable printer or Okidata series 80 printer. 100% machine language. Great for school or church classrooms.

16K cassette \$21.95
32K disk \$23.95
10KEY turns a portion of your keyboard into a numeric keypad. Turn on 10KEY or return to normal keyboard with a single keystroke. Sure makes numeric data entry easier. Reviewed in Oct. 84 RAINBOW.

16K cassette \$17.95
16K disk \$19.95
COLOR DESIGNER and your CoCo can create amazing hi-res color pictures. Create over 1000 color/texture combinations in PMODE4. Written in Extended Basic with machine language subroutines. April '84 RAINBOW. "I would not hesitate to recommend Color Designer to someone in the market for a graphics editor."

16K/32K cassette (Extended Basic req.) \$23.95
32K disk \$25.95
OKIDUMP is hi-res screen dump for hi-res CoCo pictures to Okidata series 80 printers. 100% machine language. Includes hints on printing pictures of hi-res game screens.

16K cassette \$8.95
16K disk \$10.95
AMORTIZE IT is possibly the best amortization program available for CoCo. Even allows entry of additional principal payments.

16K cassette (Extended Basic req.) \$11.95
32K disk \$13.95

EDUCATIONAL

MATHWAR is a 1st and 2nd grade math drill game. 16K Extended Basic cassette \$11.95
32K Disk \$13.95

FRESHCHOOL PAT Alphabet recognition and counting drills. Machine language subroutines for speed. Hi-res graphics and sound. 16K cassette (Extended Basic req.) \$14.95
32K disk \$16.95

QUIZALL A versatile quiz program. Has study and test formats and allows printing of quiz. June '84 RAINBOW. "I found QUIZALL to be an excellent program!" 16K cassette (Extended Basic req.) \$18.95
16K disk \$20.95

ORDERING INFORMATION
• Add \$2 for shipping and handling
• Utah residents add 5.75% sales tax
• We accept checks, money orders, VISA and MASTER CHARGE
• Order by phone — 801-571-5023 (call 6:30 to 10 pm MST for technical info)
• Add \$2 for COD orders



COLOR CONNECTION SOFTWARE

1050 Buddlee Drive — Sandy, Utah 84070 — 801-571-5023

COLOR TERM + PLUS +

If you're looking for the finest terminal software you can buy, look no further! And now we've added a high-res screen display that gives you 32 by 16, 42, 51, or 64 by 24 lines.* And you can switch between the high-res screen and the normal screen *without* destroying what you have in the buffer! +PLUS+ we have a buffer editor, complete up and down load support, on-line cassette or disk reads and writes, off-line and on-line scrolling, pre-entry of data before calling, word wrap, buffer printing, selective printing, change any parameter so you can communicate with any other computer. You can send and receive Basic programs, ASCII file, as well as machine code, +PLUS+ you can save your buffer to tape (Tape or Rom version) or disk (Disk version). You can communicate with the local BBS, Compuserve™, The Source™, the main frame at work or school, other color computers, Apples, IBM PC'S, TRS-80 Model I, II, III, IV, 12, 16, 100, or any other computer via RS-232.

Compare these features with *any* other terminal program:

32x16, 42, 51, 6x24 Screen

Communications BAUD Rate: 110-19200

Printer Baud Rate: 600-9600

Select Half or Full Duplex.

Select Odd, Even, or no Parity.

Select 7 or 8 Bit Words.

Send Control Characters.

Send a True Line Break.

Separate Keys for Escape and Rubout.

Select All Caps If Needed.

Word Wrap — Eliminate Split Words.

(32 Character Mode)

Selectable Reverse or Normal Video.

(32 Character Mode)



Scroll Protect Up to 9 Lines.

Automatic Capture of Incoming Files. Send One Line At a Time From Your Buffer.

Has Programmable Prompt for "Send Next Line!"

Buffer Size Indicator.

Complete Up and Down Load Support.

Improved Buffer Editor.

On/Off Line Scrolling of Buffer.

On/Off Cassette or Disk Reads and Writes.

Pre-Enter Data Before Going On-Line.

Save/Load Machine Code, Basic Programs or Files.

Select Printer Line Feeds If Needed or Ignore All Line Feeds In Buffer.

*Disk and Rom Pack only (not on tape). PRICE: \$29.95 (TAPE) \$39.95 (ROM PACK) \$39.95 (DISK)

**WE'VE MOVED TO
LARGER QUARTERS!
SEE NEW ADDRESS BELOW**



HARDWARE

SUPER PRO KEYBOARD — Mark Data replacement... \$64.95

DOUBLE SWITCH I — This is our original switch box. Two LEDs show you which port is being used, 1 or 2. High quality parts, and a new great looking yellow face plate. \$29.95

DOUBLE SWITCH II — Same as the above switch box, but we have added three RCA jacks, and a switch which allows you to switch between your 80 column board output, and your computer output at a touch instead of unplugging. \$39.95

VIDEO SWITCH — Switch between your 80 column board, and your computer's output. Two LEDs display the device. \$19.95

DOUBLE CABLE — If you don't have a lot of money to spend, you can hook a modem and a printer up at the same time using this Y-Cable. Works with most printers. \$14.95

WORD PAK (80 Column Board) — This is one of the finest pieces of hardware to come along since the CoCo. Allows you to display a real 80 column screen, not the graphics that are sometimes difficult to read. Comes with a software driver that will interface basic into the 80 column board. \$139.95

Y-CABLE — Used with the **WORD PAK** when disk drives are being used. Not needed if you own some type of multi-port device, the Multi-Pak Interface for instance. \$29.95

DOUBLE DRIVER — Best video driver available for the Color Computer. Made by our friends at Moreton Bay Software. Specify regular CoCo or CoCo II. \$24.95

DOUBLE SPEAKER — This plug-in device gives you sound with a monitor. Plugs right in, nothing to solder. \$19.95

HARD DISK DRIVE FOR THE CoCo WITH CONTROLLER:

5 MEG HARD DISK DRIVE \$1299.95

10 MEG HARD DISK DRIVE \$1599.95

DOUBLE DOS II

NEW AND IMPROVED!! Double Dos II is an enhanced version of our original **DOUBLE DOS** program. The original Double Dos was so well received that we decided to add even more capabilities, and fix some of the limitations in the original program. With Double Dos you can use 35, 40 or 80 track (double and single sided) drives all on one system, all at the same time. (The use of double sided drives will limit you to three drives.) Works with all types of 5 1/4 or 3 inch drive systems and All commands are supported in Double Dos! Double Dos is totally transparent to your basic programs! If your system selection is 80 tracks, a **FREE** command will return 158 granules! Compare this to the 68 granules your system now returns. You get 78 granules with a 40 track drive, 10 more than the 35 track system. **EVERY** command in basic is supported by Double Dos. There is only one limitation, you can only open any number of files to one drive at a time, otherwise everything else is the same. Plus you get some great new commands! Look at what Double Dos will allow as new disk basic commands:

BAUD 1-6 ... change the BAUD rate with a command, no pokes!

TRACK 35,36,40,80 ... change the number of tracks.

DOUBLE ... enable the double sided option.

PDIR ... print your directory to the printer.

DUMP ON/OFF ... send a basic program to a friend without using a terminal program!

RATE 6,35 ... change the head stepping rate.

VIDEO ON/OFF ... will give you a reverse screen without a hardware modification.

SCROLL 1-255 ... change the screen scrolling speed.

COMMAND ... will list all new commands.

DUPE 0-2 ... will allow copy & backup from one side of a disk to the other side on double sided systems!

DATE ... you can enter the month, day, and year which will be stored in the directory of your disk each time you save a program or file, and you can see it when you use the **DIR** command! Very useful when looking for the most current file or program!

AND, all commands can be used inside basic programs because they have been added to disk basics list of commands! You also get full reset protection, which means that you will stay in the 64K mode until you power-down.

PRICE: \$29.95 (DISK ONLY) 64K Required

\$2.00 shipping and handling on all orders. \$3.00 charge on C.O.D. orders. Mastercard and VISA accepted. Texas residents add 5% sales tax. Allow two weeks for personal checks.

Send 20 cent stamp for free catalog.

Double Density Software



620 Kings Row
Denton, Texas 76201
Phone 817/566-2004





REAL EIGHTY-COLUMN DISPLAY!



ULTRA TERM +

PROFESSIONAL PROFESSIONAL PROFESSIONAL PROFESSIONAL

This program is the **ultimate** in coco communicating!! **Ultra Term +** is used with a plug-in 80 column board* that gives you **True** 80 columns, not the graphics display that is unreadable at 80 columns. This is truly a **Professional** Package that is so easy to use that once you have used it, you'll wonder why other packages are so difficult to use, (except for Color Term + Plus + that is!) After using a terminal program that cannot give you **True** mainframe terminal emulation, you will find **Ultra Term +** indispensable! **Ultra Term +** even has a host mode that allows you to echo characters like full duplex mainframes do! There are also 10 macro keys which will allow you to save passwords, phone numbers, modem programming information, etc., + **PLUS +** you can save them to disk. Also, like all **Professional** terminal programs you can save your current parameters. This saves you set up time when moving from one system to another. + **Plus +** when used with the parallel printer port** you can print what is coming in. And what about documentation? Every feature is explained in detail and indexed for fast look up! There is also a comprehensive help section to aid those unfamiliar with telecommunications. Although this program was designed for the Professional a total novice can use it with ease. Check all the features listed below and then you decide who has the world's smartest terminal!

Baud Rates: 110-4800 (communicate)
600-9600 (printer)

Screen Format: 80 x 25 w/true upper & lower case.

Select half, full duplex or echo.

Select odd, even, mark, space or no parity.

Send all 128 characters from keyboard.

Select 7 or 8 bit words.

Select 1 or 2 stop bits.

Send a true line break.

Select all caps if needed.

Automatic capture of incoming files.

X on/X off capabilities.

Merge text or programs in buffer.

53,000 character buffer (64K).

Send and receive BASIC, FILES and machine code.

10 macro keys.

Four buffer send modes (dump,

prompted, manual & time delay)

Buffer size indicators (bytes used &

bytes remaining)

Buffer editor w/ auto key repeat.

Scroll forward & reverse to view buffer

& print viewed screen option.

Selectable printer formats (line feeds,

etc.)

Selectable trapping of incoming

characters.

Print while receiving data.

Buffer editor has these features:

Move forward and reverse through

buffer. Insert, type over, delete lines

or characters.

Block deletion or start to end of buffer

delete.

Save and load macros.

Save and load parameters.

Use 1-4 disk drive (w/SAVE, LOAD, DIR

& granule display)

Easy to use MENU driven format.

Comprehensive users manual.

Works with ALL Radio Shack™ Disk

Systems and all models of minor

computers.

Still not convinced? How about a 15

day, money back guarantee? If you don't

like the package for any reason, we will

refund your money upon return of a like-new package.† What but there is offering you this kind of deal? And customer support was never better. Simply fill out your registration card and send it back to us and you will be notified when new features, improvements, etc. become available because all registered owners will receive **Free** upgrades for a \$5.00 shipping and handling fee).

As with all good Professional programs, **Ultra Term +** is all machine code. This program has been tested by those both familiar and unfamiliar with communications programs. And when you call for some technical support, you won't get an answering machine during our business hours (10-5 CST M-Sat) under normal circumstances. Technical help is usually available all day.

PRICE: **Ultra Term +** — \$49.95 (Disk)

Word-Pak (80-column board; includes a software driver so you can use your basic programs with no modification in most cases!) **\$139.95 + \$3.00 S&H**

Y-Cable.. \$29.95 (Required if expansion port not used with disk drives)

Complete Package **Ultra Term +**, **Word-Pak** & **Y-Cable** (subtotal \$20.00 if not needed) is only **\$210.00**

***Ultra Term +** supports the 80 column board made by PBI, Inc. If you already have the board, simply order the program, but those of you who don't can get a good deal.

** Parallel Printer Port from PBI, Inc.

† Less \$10.00 reshipping charge.

DOUBLE SPOOLER

Tired of waiting for your listings? printouts? etc.? This is **THE** Spooling Program!! No need to save your programs in ASCII. You can also spool your files and you can spool **ANYTHING** you print on the screen while a program is running! Requires a minimum of 32K **AND** the 64K computer can spool really **LARGE** files!! Plus more!!
PRICE: \$19.95 (Tape) \$21.95 (Disk)

DOUBLE MAILER

At last a powerful, easy to use, mailing list program for a reasonable price. Up to 200 names can be held in memory for you to change, modify, search or print as you like. Plus, you can print out up to 1800 names without touching the keyboard. Save **thousands** of names on each disk. The machine language sort routine will sort 200 names in as little as 6 seconds! Supports single or double wide labels. Three and four line labels can be intermixed without leaving gaps in your listings! All menu driven, and easy to use. Printer support gives 600-9600 **BAUD** selection, and different print sizes if you wish. 16K Extended



Double 80 Plus



Announcing a **BREAK-THROUGH!** Now you can own an 80 column board for \$99.95. And you can choose the software you want to buy instead of being charged for something you don't want. Y-Cable available for use with disk drives. Look at these features and compare:

TRUE 80 COLUMN OUTPUT
BUILT IN SWITCH FOR COCO OR DOUBLE 80 PLUS
ADJUSTABLE VIDEO OUTPUT
GOLD PLATED EDGE CONNECTOR
DRIVERS AVAILABLE FOR BASIC, OS9 and FLEX
DISPLAY ALL ASCII CHARACTERS
ALTERNATE CHARACTER SETS AVAILABLE
METAL CASE (not cheap plastic)
ULTRA TERM+ available for this board
BACKED BY A 90 DAY PARTS AND LABOR WARRANTY

PRICES: **DOUBLE 80 PLUS** (80 column board) \$99.95
Y-CABLE \$29.95
BASIC DRIVER \$12.95
OS9 DRIVER \$12.95
FLEX DRIVER (available soon) \$12.95
ULTRA TERM+ (disk only) \$59.95

Help Us Battle the High Cost of Disk Drives



**NOW...
V-PRINT**
A utility to print
directory on paper
\$9.95



Un-DISK Drives \$49.95?

You Bet! There are empty spaces in your 32K and 64K CoCo. The Preble VDOS Un-DISK helps you fill them up with PROGRAMS!

- Un-DISK uses your computer's extra memory like a fast disk drive.
- Un-DISK can store BASIC and MACHINE LANGUAGE programs.
- Un-DISK is INVISIBLE. Yup! Un-DISK does not interfere with normal Color Computer Operation.
- Un-DISK appears only when you type the magic word VDOS.
- Un-DISK comes with comprehensive instructions which you may not need because:
- Un-DISK is self-prompting and easy to use!
- Un-DISK is provided on cassette.
- Un-DISK is faster than a slow clumsy DISK DRIVE and best of all...
- Un-DISK is CHEAPER than a DISK DRIVE!
- Un-DISK will work even if you already own a disk but WHY BUY A DISK AT ALL?
- Un-DISK should be in the library of every serious CoCo user even if you own a disk says Frank J. Esser, independent reviewer for RAINBOW Magazine!

OK sure, disk drives ARE NICE. I own one. But if your finances are limited, the Un-DISK can give you much of the power of the mechanical drive. Even if you already own a disk the Un-DISK can work like a super fast extra disk.

**EXTRA... EXTRA... EXTRA... EXTRA...
Additional Power For \$14.95**

Only with VDUMP for the Un-DISK!

- VDUMP lets you make a cassette backup copy of everything stored in the Un-DISK.
- VDUMP lets you save 5, 10, 15 or more programs on a single cassette tape file.
- VDUMP lets you switch Un-DISKS. With a single load operation replace a group of financial programs with a set of children's programs. (The new VDUMP tape overwrites the old.)
- VDUMP can allow you to save a whole lot of RAINBOW ON TAPE in a SINGLE file.
- VDUMP is the perfect companion to the Preble VDOS Un-DISK.

Available from Doctor Preble's Programs, naturally! Bringing you fine Color Computer Products Since 1983!

The Preble VDOS Un-DISK \$49.95
The Preble VDUMP \$14.95
Shipping & handling
U.S. and Canada \$1.50
or \$5.00 to other foreign points

VISA and MasterCard accepted



Order From:
Dr. Preble's Programs
6540 Outer Loop
Louisville, KY 40228
(502) 966-8281

Canadians may order from Kelly Software


```

AD PS(X,Y):NEXT Y,X
140 FOR X=0 TO 6:READ PP(X):NEXT
145 FOR X=0 TO 17:TL(X)=-1:NEXT X
150 CLS:PRINT@10,"jinfile v1.1":
PRINT"      MASTER FILING SYSTEM
":PRINT:PRINT"INSERT DATA DISK,
PRESS <enter> WHEN READY";:INPUT
I$
160 PRINT@167,"KEY RETRIEVAL MOO
E"
170 PRINT:PRINT"      O      DATA IN
PUT      R      RECORD
SEARCH      S      SEARCH
WITH DEFINITIONS      P      SEARCH
WITH PRIOR      DEFINIT
IONS"
190 I$=INKEY$:IF I$="" THEN 190
200 ON INSTR(1,"ORSP",I$) GOTO 1
290,310,680,800
205 GOTO 150
220 '      find end of file
230 OPEN "O",#1,"BIBLIJIN/DAT",1
570
240 RK=LOF(1):CLOSE #1:RETURN
250 '      get file
260 OPEN "O",#1,"BIBLIJIN/DAT",1
570
270 GET #1,RECK:FOR X=0 TO 17
280 LINE INPUT #1,N$(X):N$(X)=MI
O$(N$(X),2,LEN(N$(X))-2):NEXT X
290 CLOSE #1:RETURN
300 '      retrieval
310 CLS:PRINT@2,"      known record
retrieval      ENSURE CORRECT
DATA DISK IS      IN BEFORE PROCE
EDING."
320 PRINT"      ENTER RECORD NUMBER"
;:INPUT I$
330 I$=RIGHT$(I$,3):RECK=VAL(I$)
:GOSUB 230
340 IF RECK>RK OR RECK<1 THEN PR
INT@355,"IMPROPER ENTRY, (" ;RECK
;") RE00":GOTO 320
350 GOSUB 260:GOSUB 3B0:PRINT:PR
INT "ANOTHER RECORD";:INPUT I$
360 IF LEFT$(I$,1)="Y" THEN 310
ELSE 150
370 '      page 0
380 TV$="": I$=LEFT$(N$(1),1)
400 A=INSTR(1,"BPSA",I$)-1
410 FOR X=6 TO 14:IF NM$(A,X)="N
A" THEN N$(X)=" ":NEXT X
420 CLS:I=0:GOSUB 620
430 '      key in request
440 I$=INKEY$:IF I$="" THEN 440
450 IF I$="0" THEN I=0:GOSUB 620:
GOTO 440
460 I=VAL(I$):IF I>0 AND I<6 THE

```

```

N CLS:IF I=1 THEN GOSUB 620:GOTO
440 ELSE GOSUB 640:GOTO 440
470 ON INSTR(1,"ASETDXZ",I$) GOT
O 510,590,1080,1020,940,490,490
480 GOTO 440
490 RETURN
500 '      print all
510 PRINT:PRINT "PREPARE PRINTER
, <enter> WHEN READY";:INPUT B
$
520 FOR Y1=0 TO 17:Y=PX(A,Y1):IF
Y<0 THEN 530
525 GOSUB 550
530 NEXT Y1:PRINT#-2,STRING$(75,
61),STRING$(2,13):GOTO 420
540 '      print format
550 IF NM$(A,Y)="NA" THEN RETURN
ELSE PRINT #-2,USING "%
%;NM$(A,Y);:PRINT#-
2," : ";
551 '      G1 AND G2 ARE UNDERL
INE CODES FOR LP VIII/OMP 200
552 G1=1:G2=1:TN$=N$(Y):IF Y=4 T
HEN G1=15:G2=14
555 IF LEN(TN$)<53 THEN PRINT#-2
,CHR$(G1);TN$;CHR$(G2):GOTO 570
560 TN=INSTR(35,TN$," "):IF TN=0
THEN TN=52
562 PRINT#-2,CHR$(G1);MID$(TN$,1
,TN);CHR$(G2)
565 TN$=MID$(TN$,TN):IF LEN(TN$)
<55 THEN PRINT#-2,TAB(26);CHR$(G
1);TN$;CHR$(G2) ELSE PRINT#-2,TA
B(26);:GOTO 560
570 RETURN
580 '      print summary
590 PRINT:PRINT"PREPARE PRINTER,
<enter> WHEN READY";:INPUT B$
600 FOR Y=0 TO 4:GOSUB 550:NEXT
Y:PRINT#-2,STRING$(75,126),STRIN
G$(2,13):GOTO 420
610 '      page 0 and 1
620 CLS:PRINT@0,"RECORD: ";N$(0)
;" / ";
630 '      all pages

```

DISK UTILITIES

AUTO-EXEC This ML program adds an auto-start feature to any disk based ML program. All subsequent disk copies retain auto-start feature. NOT for BASIC programs. Tape copies of modified program will not auto-start. Plus info on RESET button disable. 16/32K

BACK-WABBIT is a ML disk BACKUP utility for those who only have 1 drive. Copies 35 or 36 tracks. FAST. Does not copy dead tracks. Reads & writes six tracks in 28 seconds. Displays track/sector being copied. Gives error reports, then continues BACKUP. Requires 32K. Both require CoCo & R. Shack drive. On DISK \$17.50 each, both programs \$31.50, Missouri residents add 6% tax. GARLAND SOFTWARE
P.O. BOX 23043 ST. LOUIS, MO. 63156

```

640 FOR Y1=PP(I) TO PP(I+1)-1:P=
I
645 IF PS(0,Y1)>2 AND PS(0,Y1)<6
THEN PRINT@PS(1,Y1),STRING$(95,
32);
650 PRINT@PS(1,Y1),NM$(A,PS(0,Y1
));TV$;N$(PS(0,Y1));
660 NEXT Y1:RETURN
670 ' search
680 CLS:PRINT"READ INSTRUCTIONS
CAREFULLY TO ENSURE GOOD SEARCH
."
690 FOR XR=0 TO 2:FOR YR=0 TO 2:
LST$(XR,YR)="XXX":NEXT YR,XR
700 PRINT "SPECIFY CATEGORY/SUBC
ATEGORY (USE 'X' TO INDICATE
ALL FOR EITHER OR BOTH)";:INP
UT P$
710 PRINT:Y=0
720 PRINT"ENTER EXCLUSIVE GROUP
NBR";Y+1:X=0
730 INPUT LST$(X,Y):IF LST$(X,Y)
="" THEN LST$(X,Y)="XXX"
740 X=X+1:IF X<=2 AND LST$(X-1,Y
)<>"XXX" THEN 730
745 IF LST$(X-1,Y)="XXX" AND X=1
THEN 760

```

```

750 Y=Y+1:IF Y<=2 THEN 720
760 Y=Y-1:IF Y<0 THEN 150 ELSE L
LEN=Y
770 PRINT "enter lines to search
"
780 FOR X=0 TO 2:INPUT I$:FL(X)=
VAL(I$):NEXT X
790 IF P$="" THEN P$="XX" ELSE I
F LEN(P$)=1 THEN P$=P$+"X" ELSE
P$=LEFT$(P$,2)
800 PRINT #-2,"CATEGORY/SUBCATEG
ORY: ";P$
810 FOR Y=0 TO LLEN:PRINT #-2,"E
XCLUSIVE GROUP NBR";Y+1:FOR X=0
TO 2:PRINT #-2,LST$(X,Y):NEXT X,
Y
820 PRINT#-2," ":RECK=0:GOSUB 23
0
830 RECK=RECK+1:IF RK<RECK THEN
150 ELSE GOSUB 260
840 IF LEFT$(P$,1)<>"X" AND LEFT
$(P$,1)<>LEFT$(N$(1),1) THEN B30
850 IF RIGHT$(P$,1)<>"X" AND RIG
HT$(P$,1)<>MID$(N$(1),2,1) THEN
830
860 Y=0
865 X=0:F1=0:F2=0:F3=0
870 F1=INSTR(N$(FL(X)),LST$(0,Y)
)
880 F2=INSTR(N$(FL(X)),LST$(1,Y)
)
890 F3=INSTR(N$(FL(X)),LST$(2,Y)
)
900 IF F1>0 OR F2>0 OR F3>0 THEN
920
910 X=X+1:IF X>2 THEN B30 ELSE 8
70
920 Y=Y+1:IF Y<=LLEN THEN B65
925 GOSUB 3B0:IF I$="Z" THEN 150
ELSE B30
930 ' define tailoring
940 PRINT:PRINT "ENTER YOUR ELEM
ENT NUMBERS IN THE ORDER YOU W
ANT THEM PRINTED. ENTER A NEGATIV
E NUMBER TO END THE LIST (RANGE
0 TO 17)
950 FOR X=0 TO 17:INPUT TL(X):IF
TL(X)<0 OR TL(X)>17 THEN 970
960 NEXT X:LOOP=20
970 FOR X=0 TO 17:IF TL(X)<0 THE
N LOOP=X-1:GOTO 990
980 NEXT X
990 IF LOOP<0 THEN 420 ELSE IF L
OOP>17 THEN LOOP=17
1000 GOTO 420
1010 ' print tailor
1020 PRINT:PRINT "PREPARE PRINTE
R, <enter> WHEN READY";:INPUT B

```

FLY at MACH 2!

F-16 Instrument Flight Simulator

DON'T CHUG AROUND AT 90 KNOTS WITH OTHER SIMULATORS. F-16 FLYS MACH 2.6, IS FULLY AEROBATIC, VERY REALISTIC.\$21.95



DESCENDERS

100% ML FOR RADIO SHACK® LPV11, DMP100, TDP-1, AND GORILLA BANANA®.\$17.95

TSPOOL

100% ML SOFTWARE SPOOLER FOR TELEWRITER-64® ONLY. INCLUDES DESCENDERS.\$24.95

TELEWRITER-64

THE BEST CoCo WORD PROCESSOR AVAILABLE TODAY!
TAPE.....\$49.94 DISK.....\$59.95

AUTOKEY Repeat

ALL KEYS REPEAT WHEN HELD · SHORTENS TYPING & PROGRAMMING TIME.\$9.95

SAVE \$\$\$ TYPE IT IN YOURSELF · BASIC LISTING TO CREATE AUTOKEY.\$2.95

CALL (813) 321-2840 9-5 PM EST FOR ORDERING OR INFORMATION



KRT Software Inc.

P. O. Box 41395

St. Petersburg, Florida 33743




```

$
1030 IF LOOP<0 THEN PRINT "not d
efined": GOTO 420
1040 FOR X=0 TO LOOP:Y=TL(X):IF
Y>=0 THEN GOSUB 550
1050 NEXT X
1060 PRINT#-2,STRING$(75,42),STR
ING$(2,13):GOTO 420
1070 ' text editor
1080 CLS:PRINT"ENTER LINE NUMBER
TO CORRECT TYPE ANY LETTER T
O QUIT":INPUT I$
1090 P1=VAL(I$):IF P1<1 OR P1>17
THEN 420
1100 CLS:PRINT@B,"** text editor
**":KT=1:M$=" "+N$(P1)+" ":L$="
":R$="":V$=CHR$(128)
1110 PRINT@32,N$(P1)
1120 PRINT@223,M$:PRINT@223+KT,V
$:
1130 C$=INKEY$:IF C$="" THEN 113
0
1135 P2$="HOCI "+CHR$(9)+CHR$(8)
+CHR$(21)+"S"+CHR$(13)
1140 ON INSTR(1,P2$,C$) GOTO 115
0,1155,1160,1180,1170,1170,1190,
1190,1220,1230
1145 GOTO 1120
1150 M$=LEFT$(M$,KT):LINE INPUT
B$:M$=M$+B$+" ":KT=KT+LEN(B$):GO
TO 1120
1155 M$=LEFT$(M$,KT)+MID$(M$,KT+
2):GOTO 1120
1160 B$=INKEY$:IF B$="" THEN 116
0 ELSE MID$(M$,KT+1,1)=B$:IF KT=
LEN(M$)-1 THEN 1120 ELSE KT=KT+1
:GOTO 1120
1170 IF KT=LEN(M$)-1 THEN 1120 E
LSE KT=KT+1:GOTO 1120
1180 LINE INPUT B$:M$=LEFT$(M$,K
T)+B$+MID$(M$,KT+1):KT=KT+LEN(B$
):GOTO 1120
1190 IF KT=1 THEN 1120 ELSE KT=K
T-1:GOTO 1120
1220 B$=INKEY$:IF B$="" THEN 122
0 ELSE G=INSTR(KT+1,M$,B$):IF G=
0 THEN 1120 ELSE KT=G-1:GOTO 112
0
1230 IF LEN(M$)<3 THEN N$(P1)=M$
:GOTO 1250
1240 M$=MID$(M$,2):N$(P1)=LEFT$(
M$,LEN(M$)-1)
1250 IF LEN(N$(P1))>LN(P1) THEN
N$(P1)=LEFT$(N$(P1),LN(P1))
1260 PRINT@224,N$(P1)
1270 GOTO 1650
1280 ' start data input
1290 CLS:PRINT" data inp

```

```

ut FOR CREATING OA
TA FILES":GOSUB 1500:GOTO 1570
1300 ' SCREEN DISPLAY
1310 CLS:PRINT@2,"CATEGORY: ";N
M$(A,0):PRINT@34,"RECORD: ";N
$(0):PRINT@66,"ENTRY: ";NM$(
A,Y):PRINT@9B,"LENGTH: ";LN(Y
)
1320 PRINT@416,STRING$(32,198):P
RINT@3B2-LN(Y),STRING$(34,198);:
RETURN
1330 ' LONG ENTRY OVER LENG
TH
1340 GOSUB 1310:LINE INPUT N$(Y)
1350 IF N$(Y)="" THEN N$(Y)="NO
ENTRY"
1360 IF LEN(N$(Y))>LN(Y) THEN GO
SUB 1310:PRINT@448,"ENTRY TOO LO
NG, SAVED AS ABOVE";N$(Y)=LEFT$(
N$(Y),LN(Y)):PRINT@416-LN(Y),N$
(Y):FOR D=1 TO 2000:NEXT D
1370 RETURN
1380 ' SHORT ENTRY OVER LE
NGTH
1390 GOSUB 1310
1400 LINE INPUT N$(Y):IF N$(Y)=""
THEN N$(Y)="NO ENTRY"

```



CANCOCO SOFTWARE

P.O. Box 2914,
Medley, Alberta
Canada T0A 2M0

SKEET

\$19.95



A 5 color game that teaches the location of keys. Thirteen levels of difficulty and four speeds challenge both beginner and expert typists. Although not a tutorial, if you can master the highest level and speed, you can type

Script +

\$17.95



An educational program that uses 'handwriting' to improve spelling for grades 3 - 8. Words can have up to 16 letters, including special characters, accentuated vowels and diagraphs. Input your lessons from the keyboard or cassette, and output results to cassette and/or printer.

Stomp

\$24.95

is a unique half-hour board game for 2 - 4 players aged 8 - 80, with very few rules but requiring concentration and strategy to convert your chances to victory. Use joystick(s) and/or optional keyboard. To Stomp or not to Stomp...? A very entertaining family game!

All programs are on cassette, documented, and use 32K ECB PMODE 3 graphics. Reviews have been or will be published in this magazine.

UNDER DEVELOPMENT: GOLF-NET, GOLF-CAP, COCO-CPM and, for model train buffs, SKEDULER.

```

1410 IF LEN(N$(Y))>LN(Y) THEN GO
SUB 1310:PRINT@44B,"ENTRY TOO LO
NG, RECO";:PRINT@416-LN(Y),"":G
OTO 1400
1420 RETURN
1430 '      STORE DATA ON DISK
1440 IF RECK<1 THEN 1710 ELSE OP
EN "O",#1,"BIBLIJIN/DAT",1570
1450 FOR X=0 TO 17:WRITE #1,N$(X
):NEXT
1460 R1=VAL(RIGHT$("00"+STR$(REC
K),3))
1470 PUT #1,R1
1480 CLOSE #1:GOTO 1650
1490 '      CHECK FOR LAST RECO
RD ON DISK.
1500 OPEN "O",#1,"BIBLIJIN/DAT",
1570
1510 RK=LOF(1)+1:CLOSE #1
1520 IF FREE(0)>1 THEN 1550
1530 CLS:PRINT@34,"** disk full
**";:PRINT@66,"INSERT ANOTHER DI
SK";:PRINT@98,"PRESS <ENTER> WHE
N READY"
1540 INPUT A$:GOTO 1500
1550 PRINT@130,"ENTER DISK NUMBE
R";:INPUT A:RECK=RK+A*1000:N$(0)
=STR$(RECK):RETURN
1560 '      DETERMINE MAIN AND
SUB CATEGORY CODES
1570 PRINT"ENTER CATEGORY/SUBCAT
EGORY CODE":INPUT N$(1):A=0
1580 IF N$(1)="" THEN 1570 ELSE
IF LEN(N$(1))<>2 THEN 1570
1590 B$=RIGHT$(N$(1),1):A$=LEFT$
(N$(1),1)
1600 A=INSTR(1,"BPSA",A$)-1:IF A
<0 THEN 1570
1610 FOR Y1=2 TO 17:Y=PX(A,Y1):I
F Y<1 THEN 1650
1620 IF Y<6 OR Y>14 THEN GOSUB 1
340 ELSE GOSUB 1390
1630 NEXT Y1
1640 '      DATA ENTRY COMPLETE
1650 CLS:PRINT@3B,"data entry co
mplete      FOR RECORD
":RECK:PRINT@106,"KEY OPTION":PR
INT:PRINT"      S      SAVE FILE ON
DISK      R      REVIEW ENTRY
"
1660 PRINT"      X      FINISHED DA
TA ENTRY      N      INPUT NEW E
NTRY"
1670 B$=INKEY$:IF B$="" THEN 167
0 ELSE IF B$="S" THEN 1440 ELSE
IF B$="R" THEN GOSUB 380:GOTO 16
50
1680 IF B$<>"X" AND B$<>"N" THEN

```

```

1650 ELSE PRINT @352,"HAS FILE
BEEN SAVED ON DISK YET?YOU ARE A
BOUT TO ERASE MEMORY. TYPE 'S'
TO SAVE, 'X' TO      CONTINUE"
;
1690 INPUT C$:C$=LEFT$(C$,1):IF
C$="S" THEN 1440 ELSE IF C$<>"X"
THEN 1650
1700 IF B$="N" THEN 1290 ELSE 15
0
1710 PRINT"RECORD NUMBER ERROR -
PROGRAM ABORT":INPUT I$:GOTO 42
0
2000 REM
2005 DATA 5,2,250,250,115,50,32,
32,12,10,30,30,20,8,25,220,220,2
20
2010 DATA BIBLIOGRAPHY,CATEGORY,
SUBJECT,AUTHOR,TITLE,JOURNAL,PLA
CE OF PUB.,PAGES/PUBLISHER
2015 DATA DATE,VOLUME,ILLUSTRATI
ONS,LOCATION,CALL NUMBER,NOTES/C
OURSE,VALUE(YEAR),COMMENTS(1),CO
MENTS(2),COMMENTS(3)
2020 DATA PEOPLE,CATEGORY,SUBJEC
T,NAME,ADDRESS,POSITION,NA,NA,DA
TE,NATIONALITY,NA,INSTITUTION
2025 DATA PHONE NUMBER,NOTES,NA,
COMMENTS(1),COMMENTS(2),COMMENTS
(3)
2030 DATA STRUCTURES,CATEGORY,SU
BJECT,ARCHITECT,BUILDING NAME,TY
PE(STYLE),DRAWINGS - INSTIT.,HEI
GHT,DATE,MATERIAL
2035 DATA DRAWINGS - CITY,LOCATI
ON,FILE NUMBER,NOTES/SLIDES,DRAW
INGS - TYPE,COMMENTS(1),COMMENTS
(2),COMMENTS(3)
2040 DATA ARTWORK,CATEGORY,SUBJE
CT,ARTIST,ARTWORK TITLE,COUNTRY,
NA,DIMENSIONS,DATE,MEDIUM,NA,LOC
ATION
2045 DATA FILE NUMBER,NOTES/SLID
ES,DRAWINGS - TYPE,COMMENTS(1),C
OMMENTS(2),COMMENTS(3)
2050 DATA 0,1,2,3,4,5,6,7,8,9,10
,11,12,13,14,15,16,17,0,1,2,3,4,
11,12,5,9,8,13,15,16,17,-1,-1,-1
,-1,0,1,2,3,4,5,8,9,7,11,6,14,10
,12,13,15,16,17,0,1,2,3,4,9,8,11
,5,7,12,13,14,15,16,17,-1,-1
2055 DATA 1,2,3,4,5,10,9,8,13,12
,1,2,11,12,13,8,9,3,4,5,7,14,6,1
0,15,16,17,15,32,128,192,256,320
,384,416,448,480,15,32,320,384,4
16,448,480,0,288,416,0,96,192,28
8,0,256,0
2060 DATA 0,10,17,20,24,26,27

```


Now you're gonna catch it!

Football Fever

Part One of a two-part series.

By Fred B. Scerbo
Rainbow Contributing Editor

(Editor's Note: If you have an idea for the Wishing Well, submit it to Fred c/o THE RAINBOW. Remember, keep your ideas specific, but don't forget that this is BASIC. All programs resulting from your wishes are for your use but remain the property of the author.)

Well, the mail has really started to come in at a steady pace with ideas and wishes. This month's program (as well as next month's) is a combination of a number of wishes. Sorry that these require 32K. I'll give you 16K folks some hints a little later, but this would be a great time to go the up-grade route (and the RAINBOW ON TAPE route for those who don't yet get it).

Before we get down into the body of this month's wish, you'll notice something about this month's column: it's a little shorter than usual. There are two reasons for this. First, since this is in two

parts covering all the NFL football teams, there would be no sense in giving the same technical information both months. Therefore, some of the more technical aspects of these listings will be covered next month.

The Wish

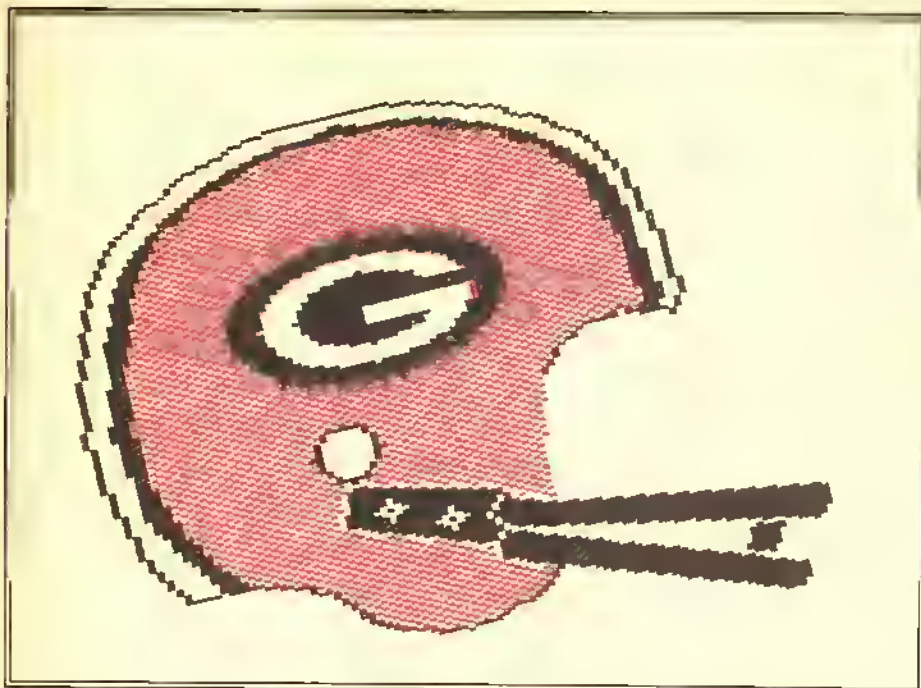
Ever since *Rockfest* and *Baseball Fever*, I have gotten many requests for

requests for repeats, especially for the remaining baseball teams. Have no fear, the remaining teams will appear by spring. It would be rather foolish to put them out now.

Since fall is here, why not do the football teams for the NFL? Well, one person's wish suggested that I do the team helmets. Great idea! The natural



(Fred Scerbo is a special needs instructor for the North Adams Public Schools. He holds a master's in education and published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.)



advantage is that such listings could have some common subroutines, such as those that draw the empty helmet shell. Compared to *Baseball Fever*, this task was easier.

The Task

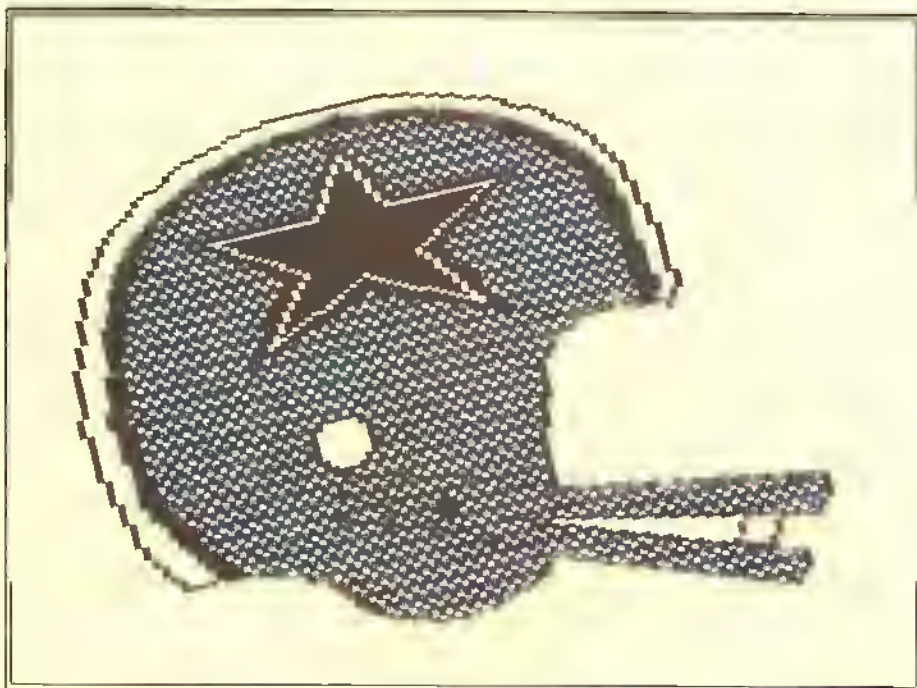
As you will recall from some of our other graphic experiments, I have tried a number of newer tricks to get other than your standard red, blue, black and white color set in *PMODE 4* to *PMODE 3* without changing the *SCREEN* command. We even experimented by poking around location 178, but that can give rather striped results.

What we would need with our NFL helmets would be a way to get the extra colors of yellow, purple, gold, silver and green while still in *PMODE 4*. Sound impossible? Not really! If you've played *Sands of Egypt* or some of the new graphic Adventures I have seen, you will find yellow sand and a light blue sky in many cases.

How do they do this? Take a close look at the screen when yellow or light blue or purple is generated, and you might get a clue as to how this is accomplished. (If you were an artist with paint and you only had the primary colors, what would you do?)

I hope that you will closely examine the screen and the listing to see if you can guess how the technique works. It is really quite simple. The only one I haven't completely conquered is green, so we will go the *POKE178* route for that one.

The technique used does not allow for easy *PAINTing*, so we are storing the patterns in an array with *GET* and displaying them with the *PUT* command. The catch is that we use *OR* rather than *PSET* with the *PUT* command. The result is that you will see our new colors actually work like the *PAINT* command does. You may also have to slightly adjust your tint since I have seen some people's TVs that are a little off in adjustment of tint. You will like these colors more than the standard four. More on this next month.



The Program

The popularity of *Baseball Fever* had to do with the fact that a menu could be used to select any team. This program has included this feature as well as an automatic display which will continually flip through all the teams. There is a third feature which really makes these programs a lot of fun. I have merged part of the *Screen Quiz* program from a previous "Wishing Well." Therefore, the third option will randomly paint a helmet and then give a multiple choice quiz at the bottom of the screen. Can you guess all the teams?

I have greatly streamlined the quiz so as to not include the lowercase letters, thus saving some memory and typing. Be very careful to type all data accurately. When people write in about bugs in these programs, it is almost always the data.

To use this program, on running it, you will see a large colorful 84. The eight is one color and the four is another, either red or blue. Press the number which is RED and you will have the proper color set. (I prefer this to pressing the reset button.)

Your next choice is A) Automatic, B) Individual or C) Quiz. When the helmets are on automatic, pressing ENTER will *reRUN* the program. Pressing ENTER on individual helmets will return you to the menu. If you take the quiz, you must go all the way through it, and get your score, or press 'S' to stop. You can

re RUN or end the program by pressing 'Y' or 'N'.

For 16K ECB

Those of you who want shorter versions can try typing in just the lines for each helmet. There is one catch. You must include Lines 70 - 200, and Lines

540 - 570, as well as any other subroutines which a given helmet might use. (You'll be able to tell when you are missing one.) Also include 210 GOTO 575. This will prevent you from running into the subroutines. If you must include other subroutines, jump over them with a GOTO statement.

I think that you will find these graphics to be very interesting. See if you can figure out how the colors are created and I'll share the secrets next month. Most of all, keep those wishes coming in, but remember, only the best ideas will reach these pages.



180..... 87	1610 230
480..... 115	1710 116
810..... 53	1810 254
1010 105	5050 112
1330 43	5290 186
1410 157	5500 205
1490 27	END 26

The listing:

```

10 *****
20 * FOOTBALL FEVER B4 PART 1 *
30 * BY FRED B. SCERBO *
40 * 149 BARBOUR ST.N.ADAMS.MA*
50 * COPYRIGHT (C) 1984 *
60 *****
70 CLEAR500
80 CLS0
90 PMODE4,1:PCLS1:SCREEN1,1
100 CIRCLE(128,92),126,0,.45
110 PMODE3:FORX=0TO6STEP6:CIRC
LE(64,46+X),40,3,.B:CIRCLE(64,46
+X),54,3,.B:NEXTX:PAINT(64,10),3
,3:PAINT(64,96),3,3
120 COLOR2,2:LINE(220,4)-(234,17
0),PSET,BF:LINE(140,4)-(154,90),
PSET,BF:LINE(140,90)-(256,104),P
SET,BF
130 X$=INKEY$:IFX$="B"THEN140ELS
EIFX$="4"THEN150ELSE130
140 Z=0:R=3:B=2:GOTO160
150 Z=1:R=2:B=3:GOTO160
160 REM START COLOR SET
170 PMODE4,1:PCLS0:SCREEN0,1:DIM
A(50),B(50),G(50),S(50),P(50):CL
S0:LINE(32,0)-(204,1),PSET,B
180 FORX=31TO203STEP4:PSET(X+Z,0
,0):PSET(X+2+Z,1,0):PSET(X+Z,4):
PSET(X+2+Z,5):NEXT:GET(32,0)-(20

```

```

4,1),A,G:GET(32,4)-(204,5),B,G
190 PCLS:FORX=32TO204STEPB:PSET(
X+Z,0):PBET(X+4+Z,1):LINE(X+Z,10
)-(X+1+Z,10),PBET:LINE(X+4+Z,10)
-(X+5+Z,10),PSET:LINE(X+2+Z,11)-
(X+3+Z,11),PSET:LINE(X+6+Z,11)-(
X+7+Z,11),PSET
200 PSET(X+1+Z,20):PSET(X+Z,21):
PSET(X+5+Z,21):NEXTX:GET(32,10)-
(204,11),S,G:GET(32,0)-(204,1),G
,G:GET(32,20)-(204,21),P,G
210 CLS0:PMODE4,1:PCLB1:SCREEN0,
1:PMODE3:CLS0
220 CLS:PRINT@67,"FOOTBALL FEVER
'B4 PART 1"
230 PRINT:PRINTTAB(4)"NATIONAL F
OOTBALL LEAGUE"
240 PRINT" NATIONAL FOOTBALL CO
NFERENCE"
250 PRINT:PRINTTAB(7)"BY FRED B.
SCERBO"
260 PRINTTAB(6)"COPYRIGHT (C) 1
984"
270 PRINT:PRINTTAB(5)"A) AUTOMAT
IC DISPLAY"
280 PRINTTAB(5)"B) INDIVIDUAL DI
SPLAY"
290 PRINTTAB(5)"C) QUIZ ON TEAM
HELMETB"
300 X$=INKEY$:IFX$="A"THEN510ELS
EIFX$="B"THEN310ELBEIFX$="C"THEN
5010ELSE300
310 CLS:PRINT:PRINTTAB(7)"A) LOS
ANGELES"
320 PRINTTAB(7)"B) MINNESOTA"
330 PRINTTAB(7)"C) GREEN BAY"
340 PRINTTAB(7)"D) CHICAGO"
350 PRINTTAB(7)"E) SAN FRANCISCO
"
360 PRINTTAB(7)"F) ATLANTA"
370 PRINTTAB(7)"G) ST. LOUIS"
380 PRINTTAB(7)"H) DALLAS"
390 PRINTTAB(7)"I) NEW ORLEANS"
400 PRINTTAB(7)"J) PHILADELPHIA"
410 PRINTTAB(7)"K) DETROIT"
420 PRINTTAB(7)"L) WASHINGTON"
430 PRINTTAB(7)"M) NEW YORK"
440 PRINTTAB(7)"N) TAMPA BAY"
450 X$=INKEY$:IFX$="I"THEN450
460 IFX$=CHR$(13)THEN RUN

```

```

470 IF X$<"A" THEN 450 ELSE IF X
$>"N" THEN 450
480 XX=ABC(X$)-64:ON XX GOSUB590
,670,760,850,920,1010,1080,1170,
1250,1370,1450,1520,1640,1720
490 X$=INKEY$:IFX$=CHR$(13)THEN3
10
500 GOTO490
510 FORXX=1TO14:ON XX GOSUB590,6
70,760,850,920,1010,1080,1170,12
50,1370,1450,1520,1640,1720
520 FORK=1TO900:IFINKEY$=CHR$(13
)THEN RUN ELSE NEXTK
530 NEXTXX:GOTO510
540 CIRCLE(118,46),80,BL,.6,.53,
.95:CIRCLE(88,72),56,BL,1.3,.39,
.6:CIRCLE(147,68),56,BL,1.3,.92,
.02:CIRCLE(184,88),26,BL,.7,.53,
.85
550 DRAW"BM160,84"+BL$+"DBL2DBL2
01BM-12,-4H4M-40,-10M-4,+12M+40,
+14NE404M+B0,+2BE4U4M-B0,-2BH4NE
6F4M+B6,+1BE4U6M-72,-12BM+5B,+20
M-4,+BM-9,-2M+4,-B"
560 CIRCLE(124,124),34,BL,.7,.1,
.4:CIRCLE(60,144),40,BL,.6,.71,.
96:CIRCLE(102,92),10,BL,.9:RETUR
N
570 CIRCLE(110,110),4,W,.9:CIRCL
E(126,116),4,W,.9:RETURN
580 'LOS ANGELES
590 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3:GOSUB600:GOTO610
600 BL=1:BL$="C1":GOSUB540:CIRCL
E(128,68),80,1,.8,.24,.9:CIRCLE(
128,78),56,1,.8,.36,.9B:CIRCLE(1
08,96),26,1,.8,.77,.1:CIRCLE(112
,100),40,1,.65,.77,.1:RETURN
610 PMODE4:PAINT(128,28),0,0:PAI
NT(148,100),0,0:PMODE3
620 FORY=4TO124STEP2:PUT(32,Y)-(
204,Y+1),A,OR:NEXT:GOSUB600
630 PMODE4:PAINT(128,4),0,0:PAIN
T(128,70),0,0
640 W=0:GOSUB570
650 RETURN
660 'MINNESOTA
670 PMODE4:PCLS1:SCREEN1,1:PMODE
3:BL=1:BL$="C1":GOSUB540
680 PAINT(128,6),1,1
690 CIRCLE(138,60),24,4,.8,.74,.
45:DRAW"BM138,42C4M-6B,-6M-14,-6
M+10,+20M+60,+20":PAINT(138,50),
4,4:FORX=1TO3:CIRCLE(138,59+X),3
2,R,.8,.95,.4:NEXTX
700 FORY=0TO154STEP2:PUT(32,Y)-(
204,Y+1),P,OR:NEXT:GOSUB540
710 GOTO730

```

```

720 PAINT(110,106),2,3:PAINT(150
,122),2,3:PAINT(150,134),2,3:PAI
NT(210,140),2,3
730 W=1:GOSUB570
740 RETURN
750 'GREEN BAY
760 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3:BL=1:BL$="C1":GOSUB540:GOSUB
780:CIRCLE(116,54),40,1,.5:PAINT
(128,16),1,1
770 FORY=0TO154STEP2:PUT(32,Y)-(
204,Y+1),A,OR:NEXT:GOSUB540:GOSU
B780:GOTO790
780 BL=1:FORY=0TO2:FORX=0TO1:CIR
CLE(118+Y,46),72-X,BL,.6,.53,.97
:CIRCLE(88+Y,72),48-X,BL,1.3,.35
,.6:CIRCLE(147+Y,68),48-X,BL,1.3
,.92,.02:NEXTX:NEXTY:RETURN
790 CIRCLE(116,54),40,1,.5:CIRCL
E(116,54),32,1,.5:PAINT(116,72),
1,1:CIRCLE(116,54),20,1,.5:PAINT
(116,54),1,1
800 PMODE4:LINE(116,54)-(152,50)
,PSET,BF:LINE(116,54)-(146,58)
,PSET,BF
810 PMODE3:PAINT(110,106),1,1:PA
INT(150,122),1,1:PAINT(150,134),
1,1:PAINT(210,140),1,1:BL$="C4":
GOSUB550
820 W=4:GOSUB570
830 RETURN
840 'CHICAGO
850 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3:BL=1:BL$="C1":GOSUB540:PAINT
(128,16),1,1
860 CIRCLE(116,54),40,4,.5:CIRCL
E(116,54),28,4,.5:PAINT(116,72),
R,4
870 PMODE4:LINE(144,58)-(154,50)
,PSET,BF:LINE(140,52)-(158,56),P
RESET,BF:PMODE3:DRAW"BM78,54C4NL
BL4NE4NF4UR2"
880 PMODE3:PAINT(110,106),1,1:PA
INT(150,122),1,1:PAINT(150,134),
1,1:PAINT(210,140),1,1:BL$="C4":
GOSUB550
890 W=4:GOSUB570
900 RETURN
910 'SAN FRANCISCO
920 PMODE4,1:PCLS1:SCREEN1,1:PMO
DE3:BL=1:BL$="C1":GOSUB540:GOSUB
780:CIRCLE(116,36),42,1,.5:PAINT
(128,12),1,1
930 FORY=0TO154STEP2:PUT(32,Y)-(
204,Y+1),0,OR:NEXT
940 BL=R:FORY=0TO2:FORX=0TO2:CIR
CLE(118+Y,46),72+X,BL,.6,.53,.97
:CIRCLE(88+Y,72),48+X,BL,1.3,.35

```



```

, .6: CIRCLE (147+Y, 6B), 47+X, BL, 1.3
, .92, .02: NEXT X: NEXT Y
950 BL=1: BL$="C1": GOSUB 540: CIRCLE (116, 36), 36, 1, .5: PAINT (12B, 1B),
1, 1: PAINT (12B, 30), R, 1
960 DRAW "BM120, 22C404L2H2L2H2L40
NR60L2NR6UL20L20L20L202RNU202RNU
6NR1B0NR20R20R20N04LNO6LO6L1BUNR
6UL2R6LBN03ULND4BUBR16R40NL30NL2
"
970 DRAW "B040BLNUBLNUBLNUBLN4R10
L6U2L2U4R12ND2UNL12UNL12NU2BU6NR
100R1002"
980 PMODE3: PAINT (110, 106), 1, 1: PAINT (150, 122), 1, 1: PAINT (150, 134),
1, 1: PAINT (210, 140), 1, 1: BL$="C4":
GOSUB 550: W=4: GOSUB 570
990 RETURN
1000 'ATLANTA
1010 PMODE4, 1: PCLS1: SCREEN1, 1: PM
ODE3: BL=1: BL$="C1": GOSUB 540
1020 BL=1: CIRCLE (11B, 46), 72, BL, .
6, .53, .97: CIRCLE (BB, 72), 4B, BL, 1.
3, .35, .6: CIRCLE (147, 6B), 4B, BL, 1.
3, .92, .02: PAINT (12B, 12), R, 1
1030 DRAW "C4BM134, 14L44M-12, +24M
+1B, -10R2M-6, +12M+10, -6M-10, +6DB
NE10D2M+2, +BM+10, -16M-10, +16M+6,
+10M+B, -20M-B, +20M+14, +10NU24M+1
6, +6U2M-6, -BU3BRB04F4"
1040 DRAW "U4R4FBU10M-24, -10U4R10
E2NL4R14UH2L2H2L6H2UL12": PAINT (1
2B, 16), 1, 4: DRAW "N030B03BRBR"
1050 PMODE3: PAINT (110, 106), B, 1: P
AINT (150, 122), B, 1: PAINT (150, 134)
, B, 1: PAINT (210, 140), B, 1: BL$="C4"
: GOSUB 550: W=4: GOSUB 570
1060 RETURN
1070 'ST. LOUIS
1080 PMODE4, 1: PCLS1: SCREEN1, 1: PM
ODE3: BL=1: BL$="C1": GOSUB 540: GOSU
B1090: GOTO 1100
1090 CIRCLE (95, 90), 40, 1, .5, .76, .
95: DRAW "BM95, 70C1M-6, -10H2L2H2L2
H2L2H2U2H2U2H16R4H4U2R2F4R2U2H4U
4R2F2R2F2M+20, +4R30": CIRCLE (116,
40), 26, 1, .6, .77, .95: RETURN
1100 DRAW "BF12BR12NU2F2NU02M+20,
+10M-20, +10M-12, +20M+12, -20HBM+B
, -12": PAINT (144, 56), 1, 1
1110 FOR Y=40 TO 60 STEP 2: PUT (B2, Y) -
(254, Y+1), A, OR: NEXT: DRAW "M-B, +12
FBM+20, -10NL22M-20, -10NU2": GOSUB
1090: PAINT (74, 30), R, 1: GOSUB 1090
1120 DRAW "BF16BRBM-20, -6L16M+B, +
4DBR204R204FBD14": PAINT (130, 76),
1, 1: CIRCLE (132, 44), 6, 4, .7, .1, .6
1130 PAINT (110, 106), B, 1: PAINT (15

```

```

0, 122), B, 1: PAINT (150, 134), B, 1: PA
INT (210, 140), B, 1: W=4: GOSUB 570
1140 GOSUB 540
1150 RETURN
1160 'DALLAS
1170 PMODE4, 1: PCLS1: SCREEN1, 1: PM
ODE3: BL=1: BL$="C1": GOSUB 540: GOSU
B7B0: GOSUB 11B0: GOTO 1190
1180 DRAW "BM11B, 10C1M+12, +1BR34M
-24, +16M+14, +22M-36, -14M-36, +14M
+14, -22M-24, -16R34M+12, -1B": RETU
RN
1190 PAINT (12B, 10), 1, 1: PAINT (110
, 106), 1, 1: PAINT (159, 122), 1, 1: PAI
NT (150, 134), 1, 1: FOR I=0 TO 162 STEP 4
: PUT (32, I) - (204, I+1), S, OR: PUT (33
, I+2) - (205, I+3), B, OR: PUT (64, I) - (
236, I+1), S, OR: PUT (65, I+2) - (237, I
+3), B, OR: NEXT I
1200 BL=1: GOSUB 550: W=1: GOSUB 570
1210 BL=1: BL$="C1": GOSUB 540: GOSU
B7B0: GOSUB 11B0: PAINT (120, 20), 1, 1
1220 DRAW "BM11B, 14C4M+10, +16R30M
-24, +14M+14, +1BM-30, -14M-30, +14M
+14, -1BM-24, -14R30M+10, -16": GOSU
B11B0
1230 RETURN
1240 'NEW ORLEANS
1250 PMODE4, 1: PCLS1: SCREEN1, 1: PM
ODE3: BL=1: BL$="C1": GOSUB 540: GOSU
B7B0: W$="C1": W=1: GOSUB 1260: GOTO 1
310
1260 DRAW W$: DRAW "BM116, 16NR2F202
R204R206R2DBR2E2BM116, 16NL2G202L
2D4L206L20BL2H2"
1270 CIRCLE (92, 42), 16, W, .7, .4, .9
: CIRCLE (140, 42), 16, W, .7, .6, .1
1280 CIRCLE (92, 50), 16, W, .5, .5, 0:
CIRCLE (140, 50), 16, W, .5, .5, .99: CI
RCLE (116, 54), 14, W, .6, .9, .15: CIRC
LE (116, 54), 14, W, .6, .37, .6
1290 DRAW "BM11B, 72NG2R2U2R2U4R2F
2RBE2U6L2G2L6H2U2BM112, 72NF2L2U2
L2U4G2LBH2U6R2F2R6E2U2"
1300 RETURN
1310 PAINT (12B, 12), 1, 1
1320 FOR Y=0 TO 154 STEP 2: PUT (32, Y) -
(204, Y+1), G, OR: NEXT
1330 PAINT (116, 30), 1, 1: W$="C4": W
=4: GOSUB 1260: GOSUB 540: GOSUB 7B0
1340 PAINT (110, 106), 1, 1: PAINT (15
0, 122), 1, 1: PAINT (150, 134), 1, 1: PA
INT (210, 140), 1, 1: BL$="C4": GOSUB 5
50: W=4: GOSUB 570
1350 RETURN
1360 'PHILADELPHIA
1370 PMODE4, 1: PCLS1: SCREEN1, 1: PM
ODE3: BL=1: BL$="C1": GOSUB 13B0: GOT

```

```

D1390
13B0 DRAW"C1BM200,5BM-30,-20M-12
,-9L20M-9,-2L2M+10,+BD2M-40,-BL2
D2M+16,+8M-16,-2M+22,+10M-14,-2D
2M+16,+6D2L8M+1B,+6R4E2R2F4R4E2R
2F4R4E2R2E6FBR6E2R2F2R14U10":RET
URN
1390 PAINT(196,60),1,1:FDRY=24TD
74STEP2:PUT(32,Y)-(204,Y+1),S,DR
:NEXT:GDSUB540:GDSUB13B0
1400 DRAW"C1BM198,48L2M-30,-20M-
B,-4L30M-16,-4F10M-40,-BM-12,-6L
2D2M+20,+15M-16,-4L2D2M+24,+12M-
16,-2L2D2M+30,+10L10D2M+30,+10D4
R6E2R2F4R4E2R2F4R4E2R2E6FB"
1410 PMDDE3:PAINT(110,106),1,1:P
AINT(150,122),1,1:PAINT(150,134)
,1,1:PAINT(210,140),1,1:GDSUB540
1420 POKE17B,153+Z:PAINT(12B,6),
,1:BL$="C4":GDSUB550:W=4:GDSUB57
0
1430 RETURN
1440 'DETRDIT
1450 PMDDE4,1:PCLS1:SCREEN1,1:PM
DDE3:BL=1:BL$="C1":GDSUB540:GDSU
B1460:GDTD14B0
1460 DRAW"8M150,3BR4F2R2E2UE2HLB
U2E2R2DR4DR2DR4E2U2H4M-B,-3U2M-8
,-4U4M-10,-4L2D2M-B,-2L2D2L2G4L4
D2L4D2L4D4L4D2L2D2L2D2F2G2F2G2F4
G10M-1B,+6L2H4M-6,-20U4H2L4G6D2R
4E2M+6,+20D2F4R2M-6,+16"
1470 DRAW"G4D4F2D4F2R6E2U2H2U2M+
12,-10U2F2D2G2D2F2RBE2R2F2R2F2R4
U4H2L2H2L2U2M+16,-6U2E2H2E2R2E2R
2E2F4R2E2F2RE2F2RE2M+20,+4E2R2U2
H2L6M-20,-6M+6,-2M+20,+2E2UH2L10
UL6H2UE2":RETURN
1480 PAINT(12B,4),1,1:PAINT(110,
106),1,1:PAINT(159,122),1,1:PAIN
T(150,134),1,1:FDRY=0TD162STEP4:
PUT(32,I)-(204,I+1),S,DR:PUT(33,
I+2)-(205,I+3),B,DR:PUT(64,I)-(2
36,I+1),S,DR:PUT(65,I+2)-(237,I+
3),B,DR:NEXTI
1490 GDSUB540:GDSUB1460:PAINT(12
B,12),1,1:DRAW"C4":GDSUB1460:W=4
:GDSUB570:W=1:GDSUB570
1500 RETURN
1510 'WASHINGTON
1520 PMDDE4,1:PCLS1:SCREEN1,1:PM
DDE3:BL=1:BL$="C1":GDSUB540:GDSU
B1530:GDTD1550
1530 BL=1:CIRCLE(118,46),72,BL,.
6,.53,.97:CIRCLE(88,72),4B,BL,1.
3,.35,.6:CIRCLE(147,68),4B,8L,1.
3,.92,.02
1540 CIRCLE(110,44),34,1,.8:CIRC

```

```

LE(110,44),40,1,.8: DRAW"BMB0,24C
1G16M-4,+20L2D20R2D20R2D16EBU12N
G10NU60D16R2D4R2D4R4U4R2U4R2NU50
U16H4D8G4H4":RETURN
1550 PAINT(76,110),1,1:PAINT(66,
10B),1,1:PAINT(110,16),1,1
1560 PMDDE3:PAINT(110,106),1,1:P
AINT(150,122),1,1:PAINT(150,134)
,1,1:PAINT(210,140),1,1:8L$="C4"
:G08UB550
1570 DRAW"C1":GDSUB15B0:GDTD1590
1580 CIRCLE(110,40),24,1,.7,.55,
.B5: DRAW"C1BM124,30F4D2M+4,+6D2L
4D2F2NL5D6L6M-B,+4D6M-12,-4L8E2U
2E2U4L4D2L2D2L4U2L2U4E2U2G4L2U8E
4R2NDBL2E4R4D18R6NF12R4NFBR2U6R2
U8L2U6E2R12D2":RETURN
1590 PAINT(114,40),1,1:PAINT(106
,56),1,1
1600 FDRY=0TD162STEP2:PUT(32,I)-
(204,I+1),A,DR:PUT(64,I)-(236,I+
1),A,DR:NEXTI:BL$="C1":GDSUB540:
GDSUB1530:PAINT(12B,10),R,1
1610 GDSUB1580:PAINT(106,40),1,1
: DRAW"8D6NR4NL4R2NG2R2G2BD4NG6L2
G6U4BM76,60D40BL10U64":W=1:GDSUB
570
1620 RETURN
1630 'NEW YDRK
1640 PMDDE4,1:PCLS1:SCREEN1,1:PM
DDE3:BL=1:BL$="C1":GDSUB540:PAIN
T(12B,16),1,1
1650 CIRCLE(118,46),74,4,.6,.53,
.97:CIRCLE(88,72),50,4,1.3,.35,.
6:CIRCLE(149,68),49,4,1.3,.92,.0
2:PAINT(12B,2),R,4
1660 DRAW"8M4B,76C4M+120,-9U4M-1
20,+9ND4BUBBR2M+6,-26M+16,-2F2M-
1,+BL4U4M-8,+1M-4,+18M+B,-1U4R2U
4L4U3R16M+2,-12R2UR4M-6,+26DL2DL
4M+2,-12L6M-2,+12M-16,+2L2H2U"
1670 DRAW"BR32R2M+12,-26U2R4UR4M
+4,+20RM+4,-20R4UR4M+2,+14R4M+2,
-14M+38,-3F4D6G2L4U6H2L2DL2DBF2R
BF2DBLD2L6DL4H2U6R4D4R4U6L6H2LH2
U9L4M-4,+22L4DL4M+4,-22L4DL6M-4,+
22L4DL6M-4,-16M-4,+16DL4DL4M-4,-
10L4DL2M-4,+10NLBM+4,-10BU4E2U2E
2RD6L6"
1680 PAINT(50,74),4,4:PAINT(56,5
4),4,4:PAINT(110,54),4,4
1690 W=1:GDSUB570
1700 RETURN
1710 'TAMPA BAY
1720 PMDDE4,1:PCLS1:SCREEN1,1:PM
DDE3:BL=1:BL$="C1":GDSUB540
1730 CIRCLE(118,40),20,1,1.3,.2,
.1: DRAW"BM136,40C1D20M-8,+20L2M-

```



```

20,-14M-2,-10":PAINT(118,20),1,1
:PAINT(118,16),R,4
1740 CDLDR4,4:FDR1=26TD90STEP2:L
INE(86,1)-(140,1),PSET:NEXT
1750 CIRCLE(100,24),32,R,.5,.45,
.3:CIRCLE(76,26),8,R,.9,0,.6:CIR
CLE(106,26),26,R,.5,.5,.99:PAINT
(76,26),R,R
1760 CIRCLE(115,40),22,R,1.2,.5,
.65:PAINT(98,36),R,R:CIRCLE(118,
40),20,R,1.3,.3,.9
1770 DRAW"BM106,60C"+STR$(R)+"M-
16,+12M-10,+4L4E10L4G8M-10,+4L2E
10M-12,+4L6U2M+12,-4E4U2M-16,+6L
6U2M+16,-8E4L8M-8,+3L4H2U2E2M+30
,-BR14"
1780 PAINT(90,60),R,R:DRAW"8M108
,64NF10UNF10UNF12UNF14UF8R10E8UG
8L10H8NL4U2F8R4UL4H8R2F8R2UL2H8F
4UR68U4L4NH2R6NE2L4BU4U6H3L6G2R2
BDNL2R4"
1790 DRAW"8R12R68UH2L6G3BU8R16D8
EU6FD10F2D2G2L2D2NR8L88L10C4L14H
2L2G2L10H2L4G2D4F2R4E2R10F2R2E2U
NL20UNL20R4DL4U2L208U14L8M-20,+6
R2M+20,-6R8M+20,-6UR14M+10,-14"
1800 CIRCLE(118,46),74,1,.6,.53,
.97:CIRCLE(88,72),50,1,1.3,.35,.
6:CIRCLE(149,68),49,1,1.3,.92,.0
2:PAINT(128,2),R,1
1810 PAINT(110,106),1,1:PAINT(15
0,122),1,1:PAINT(150,134),1,1:PA
INT(210,140),1,1:8L$="C4":GDSU85
50
1820 FDR1=100TD162STEP2:PUT(64,I
)-(236,I+1),A,DR:NEXTI:8L$="C1":
GDSU8540
1830 W=1:GDSU8570
1840 RETURN
5000 REM QUIZ 8DDY
5010 PCLS:DIMAA$(90),X(51),R(51)
,AD(50),A$(50),8$(50),NP(50):CLS
0:D=1:M$=","
5020 FDR1=0TD250STEP6:K=K+1:X(K)
=I:NEXT:FDRP=8TD58:READC$:AA$(P)
=C$:NEXT:GDTD5130
5030 DATA 8R2HU3E,8REU3H,8U58RFN
LNGNENRNF,BU3BR2DNLNRD,8RUNRDRDG
,8R8U2R2,8RRUL,UE3U,8RHNE3U3ERFD
3GL,R2U5NLD5R
5040 DATA NR3UEREUHLG,BUFREUHNLE
UL3,8R3U5D3L3UE2R,8UFREUHL2U2R3,
8UFREUHLGU2ER,8U4UR3D2G3,BUFREUH
LNGHERFG,8RREU3HLGDFRE,8R2UBU2U,
8R2NEU8U2URDLBD3RDG,8R2H2UE2,8R8
UNR28U2R2,8RE2UH2,8R2UBU2REHL2,,
U2NR3U2ERFD4
5050 DATA U3NR2U2R2FGFDGL2,8UU3E

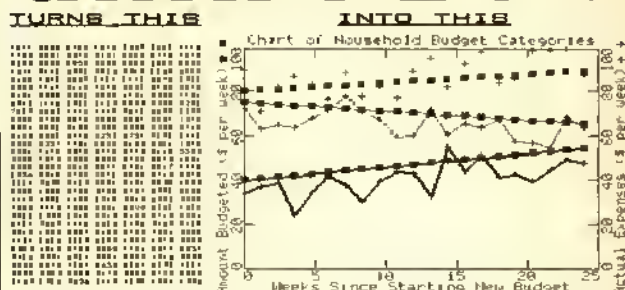
```

```

RF8D3GLH,U5RF2DG2L,NR3U3NR2U2R3,
U3NR2U2R3,8UU3ERBRBD3NLDGLH,U3NU
2R3NU2D3,8RU5,8UFEU4NRL2,U5D2RE2
G2F2D,NU5R3,U5FDRUED5,U5F3U3D5,U
5R3D5L3,U5R2FDGL2,BUU3ERFD3NHNFG
LH,U5R2FGL2F3,8UFREUHL2UERF
5060 DATA 8RU5LR3,NU5R3U5,8U5D3F
DRUEU3,NU5EU2RD2FU5,UE2H28R3DGNL
FD2,BU5D2FRD2NLU2EU2,NR3UE3UL3
5070 IF LEN(JK$)<=42THEN5110
5080 FDR T=42TD0STEP-1:IF MID$(J
K$,T,1)=" "THEN5100
5090 NEXT T:GDTD5110
5100 L$=LEFT$(JK$,T):W$=L$:GDSU8
5120:JK$=" "+RIGHT$(JK$,LEN(
JK$)-T):GDTD5070
5110 W$=JK$:GDSU85120:RETURN
5120 SL=LEN(W$):DRAW CC$:FORI=1T
DSL:8$=MID$(W$,I,1):C=ASC(8$)-32
::DRAW"8M"+STR$(X(I))+", "+STR$(Y
):DRAW AA$(C):NEXTI:RETURN
5130 REM READ DATA
5140 FDRJ=1TD14:READ A$(J),8$(J)
5150 NEXTJ
5160 REM START QUIZ
5170 CC$="C0"
5180 J=J-1

```

GRAF PLOT



GRAF PLOT turns dull rows and columns of numbers into dazzling high resolution graphs in minutes. Perfect for business, personal, educational, scientific and engineering applications.

- * NO RISK! MONEY-BACK GUARANTEE!
- * FREE R/S SCREENPRINT PROGRAM!
- * FULLY AUTOMATIC OPERATION!

"A great package gets even better ... totally impressed ... equally useful in the home and office ... meticulous, hand-holding documentation ... very easy to use! RAINBOW, 6/84 & 7/83 "A high quality product ... slick presentations" Hot CoCo, 8/84

- * Universal Screenprint Loader for non-Radio Shack printers.
- * Full ASCII upper and lower case in 4 on-screen labels.
- * 9 graphing symbols with unlimited overlay of data.
- * Full function data editing: add, change, delete and sort.
- * Graphs and data output to screen, printer, tape or disk.
- * Calculates user-defined functions, moving averages (binomial smoothing), cumulative totals and integrals (areas).
- * Saves completed graphs for instant reloading.
- * Works with all CoCo models - requires Extended BASIC.
- * Disk Only: display or print directory, fill or rename files.

16K TAPE - \$35.00, 32K TAPE - \$40.00, 32K DISK - \$45.00 (US)

ASK YOUR DEALER FOR GRAF PLOT OR ORDER DIRECT FROM:

HAWKES RESEARCH SERVICES, 1442 SIXTH ST., BERKELEY, CA, 94710
YOUR PERSONAL CHECK IS WELCOME! SHIPMENT WITHIN 48 HOURS!
\$3.00 SHIPPING ON ALL ORDERS. CA. RESIDENTS ADD SALES TAX.

```

5190 FOR I=1 TO J
5200 AO(I)=RND(J)
5210 IF NP(AO(I))=1 THEN 5200
5220 NP(AO(I))=1
5230 NEXT I
5240 FOR P=1 TO J
5250 ZW=VAL(A$(AO(P)))
5260 FOR Q=1 TO 3
5270 C(Q)=RND(J):IF C(Q)=ZW THEN
5270
5280 FOR K=Q-1 TO 0 STEP -1:IF C(K)
)=C(Q) THEN 5270
5290 NEXT K
5300 NEXT Q:C(4)=ZW
5310 FOR E=1 TO 4
5320 F(E)=RND(4)
5330 FOR K=E-1 TO 0 STEP -1:IF F(
K)=F(E) THEN 5320
5340 NEXT K:NEXTE
5350 ON ZW GOSUB 590,670,760,850,
920,1010,1080,1170,1250,1370,145
0,1520,1640,1720
5360 PMODE4
5370 Y=166:JK$=" 1) "+8*(C(F(1
))):GOSUB 5070
5380 JK$="
2) "+8*(C(F(2))):GOSUB 5070

```

```

5390 Y=176:JK$=" 3) "+8*(C(F(3
))):GOSUB 5070
5400 JK$="
4) "+8*(C(F(4))):GOSUB 5070
5410 G$=INKEY$:IF G$="8" THEN 5400
ELSE IF G$="" THEN 5410
5420 G=VAL(G$)
5430 IF G<1 THEN 5410
5440 IF G>4 THEN 5410
5450 IF C(F(G))<>ZW THEN 5480
5460 Y=186:JK$=" CORRECT: THE
ANSWER IS: "+8*(ZW):GOSUB 5070
5470 CR=CR+1:GOTO 5500
5480 Y=186:JK$=" WRONG: THE AN
SWER IS: "+8*(ZW):GOSUB 5070
5490 IR=IR+1
5500 FOR Y=1 TO 3000:IF INKEY$=CHR$
(13) THEN 5520 ELSE NEXT Y
5510 PCLS
5520 NEXT P
5530 IF CR=J THEN GOSUB 5660
5540 CLS:PRINT:PRINT
5550 J=CR+IR:IF J=0 THEN J=1
5560 PRINT:PRINT:PRINT" NUMBE
R CORRECT = "CR
5570 PRINT
5580 PRINT" NUMBER WRONG =
"IR
5590 PRINT:PRINT" STUDENT SCO
RE = ";INT(CR*100/J);"%
5600 PRINT:PRINT" ANOTHER TRY
(Y/N)";
5610 W$=INKEY$:IF W$="" THEN 5610
5620 IF W$="Y" THEN RUN
5630 IF W$="N" THEN 5630
5640 GOTO 5610
5650 CLS:END
5660 RETURN
5670 RETURN
5680 DATA 1,LOS ANGELES
5690 DATA 2,MINNESOTA
5700 DATA 3,GREEN BAY
5710 DATA 4,CHICAGO
5720 DATA 5,SAN FRANCISCO
5730 DATA 6,ATLANTA
5740 DATA 7,ST. LOUIS
5750 DATA 8,DALLAS
5760 DATA 9,NEW ORLEANS
5770 DATA 10,PHILADELPHIA
5780 DATA 11,DETROIT
5790 DATA 12,WASHINGTON
5800 DATA 13,NEW YORK
5810 DATA 14,TAMPA BAY
5820 DATA END,END

```

YOUR TRS-80* SPECIALISTS IN CANADA

COCO SOFTWARE FROM

ADVENTURE INTERNATIONAL
COMPUTERWARE
PRICKLEY PEAR
COGNITEC
EIGEN
MICHTRON

TOM MIX
SPECTRAL
SILVERWARE
SOFTLAW
MARK DATA
SKYLINE

ACCESSORIES

PRINTERS
BOTEK INTERFACES
MODEMS
JOYSTICKS

SUPER PRO KEYBOARDS
EAP GOLD CONNECTORS
BOOKS, MAGAZINES
AND MORE

WE HAVE BEEN SERVING TRS-80* USERS FOR
3 YEARS WITH THE LARGEST SELECTION OF SOFTWARE
AND ACCESSORIES AVAILABLE IN CANADA.

WRITE OR PHONE FOR A FREE CATALOGUE
MASTERCARD AND VISA ACCEPTED



CMD MICRO COMPUTER SERVICES LTD.
10447 124 ST. EDMONTON
ALBERTA T5N 1R7
PHONE 403 488-7109

*TRS-80 is a trademark of Tandy Corp

COLOR COMPUTER MAILLIST FOR RENT OR TRADE

- ★ OVER 12,000 OWNERS AVAILABLE
- ★ AVAILABLE ON LABELS OR DISKETTES
- ★ MINIMUM ORDER - 1000 NAMES
- ★ WE TRADE 1 FOR 1 (ON DISK PLEASE)
- ★ ZIP SORTED LIST
- ★ C.O.D. ORDERS AVAILABLE
- ★ WE WELCOME YOUR BUSINESS CHECK

PRESSURE SENSITIVE LABELS	\$40 ⁰⁰ per 1,000
COCO FORMATTED DISKS	\$70 ⁰⁰ per 1,000

USE ORDER FORM BELOW



I HAVE SOMETHING TO SAY!

For as little as 46 cents a program you can enjoy great games like **FROGJUMP**, **FRENZY**, **CATERPILLAR CAVE**, **SHOOTIN' GALLERY**, and great adventures. Use powerful home management programs such as **BUDGET**, **STOCK MARKET**, **BARTENDER**, **TINY CALC**, and **COST OF LIVING**. Also, enjoy the use of powerful programming utilities such as **COCO MONITOR**, **GRAPHIC SCREEN PRINT**, **RAM TEST**, **HIGH RESOLUTION TEXT**, and **SINGLE DISK COPY**. Increase your knowledge with educational programs such as **BASIC**, **SPEED UP TUTORIAL**, **FLASH CARD**, **TRIGONOMETRY TUTOR**, and our **8 PART SERIES ON MACHINE LANGUAGE**.



Every month you will receive a cassette tape with 10 ready to run documented programs.

16 K Extended Required

ORDERS SENT SAME DAY!
FIRST CLASS SHIPPING!

Back Issues Available from
July 1982
Call or write for our free catalog
Dealer Inquiries Invited

NO CHARGE ON SHIPPING
PLEASE USE ORDER FORM BELOW

PRICES

1 YR (12 ISSUES) \$55.00

6 MO (6 ISSUES) \$50.00

SINGLE COPIES \$ 6.00

MICHIGAN RESIDENTS ADD 4% FOR CABLE
OVERSEAS ADD \$1.00 FOR SUBSCRIPTION
AND \$1.00 FOR SINGLE COPIES

PERSONAL CHECK
WELCOMED

Bulk Diskettes!

AS LOW AS \$1.25 EACH!

- ★ 5¼ Single Sided Double Density
- ★ Meet All Industry Specifications
- ★ Dynamag! 100% Error Free!

Quantity	Price	Shipping
1-15	\$1.60	\$1.75
16-35	1.50	2.00
36-75	1.45	2.25
76-199	1.40	3.00
200-499	1.35	3.75
500-?	1.25	5.00

ADD 10¢ EACH FOR BLANK SLEEVES



COMPUTER CASSETTES

★★ FREE PROGRAMS ★★

on any order of 20 or more tapes, you will receive
two color computer programs of the above product!

- ★ 5 Screw Shell
- ★ Error Free Tape
- ★ Computer Grade
- ★ Lowest Prices Around

	1-29	30-59	60-?
C-10's	\$.55	\$.50	\$.45
C-20's	.65	.60	.55
C-60's	.80	.75	.70
C-90's	.90	.85	.80
Cases	.18	.16	.15
Shipping	2.00	3.00	4.00

BLANK LABELS ADD 3¢ EACH

MAIL
TO:

T & D Computer Products

P.O. BOX 256-C
HOLLAND, MI 49423
Phone: 616-396-7577



COD's

PERSONAL
CHECKS WELCOME

"IMMEDIATE SHIPPING"
Specify UPS or PARCEL POST

NAME _____

ADDRESS _____

CITY, STATE, ZIP _____

CREDIT CARD/EXP. _____

ITEM	PRICE	QUAN.	TOTAL
Outside U.S.A. Double Shipping		Subtotal Shipping	
U S A. Funds ONLY		Mil Res.	4%
		TOTAL	

RAINBOW

Give us your best: Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in THE RAINBOW's Scoreboard column. All entries must be received by the first of the month to be eligible for the following month's Scoreboard. They must include your full name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, c/o THE RAINBOW.

★ Number One

• Last Month's Number One

ANDRONE (Radio Shack)
27,805 ★John Marcogilase, Eastchester, NY
18,290 Bill Sain, Charlotte, NC
17,170 Jamia Schultz, Ontario, Canada

ANNIHILATOR (Chromesella)
18,600 ★Michael Cooney, Mansfield, OH
1,000 ●Matthew Kromeke, Albuquerque, NM

BAG-IT-MAN (Aardvark)
418,790 ★Cornelius Caesar, Hofheim, West Germany

BASEBALL (Radio Shack)
310,400 Eric Laciowski, Ollawa, Ontario
109,620 Ronald Gates, Grand Rapids, MI
101,400 Denial Baliste, Montreal, Quebec
37,110 Stephane Asselin, Haurorve, Quebec

BASEBALL (Radio Shack)
460-0 ★Walter Trainlips, Junesville, WI
324-0 Michael Rosenberg, Prestonburg, KY
296-0 Seth Newman, Ysidley, PA
223-0 Chris Young, Ft. Worth, TX
176-0 Andrew King, Vancouver, British Columbia

175-0 Bob Dewill, Blue Island, IL
121-0 Ronald Gates, Grand Rapids, MI
115-0 Eric Anderson, Rockford, IL
83-0 Andy Larson, Omaha, NE
62-0 Blaka Borwick, Boone, IA
52-0 Ryan Devlin, Louisville, KY
41-0 Ian Timothy Hicks, Edmonton, Alberta

BATS AND BUGS (THE RAINBOW)
24,600 ★Michael Rosenberg, Prestonburg, KY
3,600 Apollo Latham, Rich Square, NC
3,300 Josy Laws, Caber Creek, WV
2,850 Jon Hobson, Plainfield, WI
2,806 Robert Malfred, Wren, OH
2,500 Joel Lombardi, Newark, DE

BUSTOUT (Radio Shack)
42,000 ★Derrick Kardos, Colonia, NJ
42,000 ★Martin Klein, Skokie, IL
34,700 Sara Hennessey, Green Valley, MN
28,720 Parry Danton, New Baden, IL
27,880 Mike Wolla, Pittsburgh, PA
24,000 Charla Salmon, Madison, WI

BUZZARD BAIT (Tom Mix)
6,447,950 ★Jon Griffith
5,486,250 Jim Kennell
2,983,350 Blossom Mayor, East Greenwich, NY
2,902,700 Michael Popovich, Nashua, NH
2,087,650 Edmund Greene, Nashua, NH
999,000 Ronald Gates, Grand Rapids, MI
99,200 Andrew Chin, Austin, TX

CANDY CO. (Intracolor)
451,382 ★Randall Edwards, Ounlap, KS
99,516 Tiffany Morgan, Lookonj Min., TN

CANYON CLIMBER (Radio Shack)
8,990,000 ★Glen Giacomelli, Woodbridge, Ontario
2,326,200 Scott Oberholzer, Lexington, MA
1,603,400 Shen Mansali, Calgary, Alberta
1,571,300 Jalt Weaver, Gordonville, PA
1,426,600 Sean Whitley, Arvada, CO
74,000 Jalray Siebert, Palm Bay, FL

CAVERN COPTER (THE RAINBOW)
1213 ★Doug Schwartz, Glendale, AZ
958 Michael Malfard, Wren, OH
760 David Figel, Sardis, OH
747 Susan Ballinger, Uxbridge, Ontario
700 Mark Oay, Ft. Worth, TX

CAVERNS OF DEATH (THE RAINBOW)
2100 ★Jall Loeb, Mobile, AL

CHOPPER STRIKE (MethTron)
162,400 ★Andrew Figel, Sardis, OH
130,200 Benny Prschke, Lloydminster, Saskatchewan
87,600 David Figel, Sardis, OH
83,300 Doug Mastan, Macon, OH
72,100 ●Lisa Siclari, Staten Island, NY

CLOWNS & BALLOONS (Radio Shack)
128,210 ★Moe Tindell, Sabring, FL
116,475 Jeffrey Kochs, Grove City, OH
116,470 Colin Kettlidge, Lisdysmith, British Columbia

114,140 Charyl Pratt, Moeb, UT
110,475 Andrew Truesdale, Ferguson, MO

COLORPEDE (Intracolor)
10,001,051 ★Mark Smith, Santa Ana, CA
5,756,808 Scott Oberholzer, Lexington, MA
3,355,248 Scott Drake, Pine City, NY
2,614,230 Jerry Paikash, Winton, MI
2,547,299 Rich McGorvey, Morgantown, WV
669,678 Jon Kroll, Greendale, WI

CUMBER (Tom Mix)
204,575 ★Martin C. Klein, Skokie, IL
201,190 Jay Pribble, Dayton, IA
196,090 Randall F. Edwards, Dunlap, KS
94,940 Martin C. Klein, Skokie, IL
49,510 Doug Klein, Grand Rapids, MI
20,100 Mark Day, Ft. Worth, TX

DANGER RANGER (Mad Systems Software)
5,181 ★Chris Young, Ft. Worth, TX
2,002 Robbia Sabiciny, Mt. Zion, IL
1,962 ●Michael Rosenberg, Prestonburg, KY
1,890 Fied Thompson, Saugus, MA

DEVIL ASSAULT (Tom Mix)
3,096,900 ★Chad Barry, Rochester, NH
3,048,400 Brent Murphy, Mesa, AZ
2,890,000 Rich Van Manen, Grand Rapids, MI
1,762,980 ●Michael Rosenberg, Prestonburg, KY
1,294,300 John Statham, Stathroy, Ontario

OEVIOUS (Spectral Associates)
70,150 ★Mark Oay, Ft. Worth, TX

DOUBLE BACK (Radio Shack)
1,125,000 ★Mark Hursi, Sheridan, OR
1,080,000 Phillipa Duplantias, St. Jerome, Quebec
639,210 Paul Baker, Pittsburgh, PA
605,890 Peter Sherburne, Highland, CA
474,040 Paul Moritz, Buile, MT
138,048 Ryan Van Manen, Grand Rapids, MI
135,150 Rich Van Manen, Grand Rapids, MI
81,800 Jason Clough, Sulphur Springs, AR

COONLANO (Radio Shack)
13,358 ★Bryan Dursill, Greenville, KY

DRACONIAN (Tom Mix)
395,400 ★Paler Kral, Arcata, CA
326,180 George Hoffman, Shavertown, PA
190,840 ●Kyle Keller, Overland Park, KS
139,010 Paul MacArthur, Gillella, WI
86,600 James Tolh, Punxsutawney, PA
75,040 Barrett Ens, Calgary, Alberta

DUNKY MONKEY (Intellectronics)
1,936,000 ★Tim Greenen, Stelling Hs., MI
1,244,400 ●Jack Baran, Bensalem, PA
1,015,000 Kyla Kollar, Overland Park, KS

ELECTRON (Tom Mix)
45,510 ★John Sandberg, Concord, CA
41,750 Michael Rosenberg, Prestonburg, KY
35,400 Chad Barry, Rochester, NH
31,750 Liz Baker, Marissa, IL
22,990 Alan Morris, Chicago, MA
13,135 Andrew Chin, Austin, TX

FIRE COPTER (Adventure International)
107,370 ★Chris Haley, Auburn, CA
97,390 ●Sam Hughes, Collon, CA
78,660 Woody Farmer, Acme, Alberta
53,280 Kevin Marsh, Bokeilla, FL

FLYBY (Chromasette)
104,980 ★Oavid Finberg, Annandale, VA
32,940 Brell Johnson, Columbus, OH
28,910 Ron Suedorsky, Unversal City, TX
20,110 Rick Mansell, Calgary, Alberta
16,670 Michael Rhalrigan, Cory, NC

FOODWAR (Arcade Animation)
94,905 ★Stephane Asselin, Haurorve, Quebec

THE FROG (Tom Mix)
156,000 ★Evalyn Gagnon, North Bay, Ontario
63,440 Liz Baker, Marissa, IL

FROGGIE (Spectral Associates)
86,660 ★David Garozzo, Morrisville, PA
84,440 Bill Ida, Newark, DE
74,050 Mika Garozzo, Morrisville, PA

GALACTIC ATTACK (Radio Shack)
48,870 ★Tony Boring, Armagh, PA
48,520 Paul Sanecki
18,760 David Chaboi, Granby, Quebec

GALAGON (Spectral Associates)
760,340 ★Robert Ahlgim, Hutchinson, KS
647,230 ●Jack A. Trndla, Soquel, CA
618,800 Gary Jones, Dsls, TX
393,660 Mark Nichols, Birsay, Saskatchewan
367,990 Randall Edwards, Dunlap, KS

GHOST GOBLER (Spectral Associates)
1,007,430 ★Todd Bannam, Charleston Hs., SC
825,250 Randy Geiber, Wrimette, IL
536,260 Andrew King, Vancouver, British Columbia

423,390 Rich McGorvey, Morgantown, WV
255,000 John Osborne, Kincardina, Ontario

GONE FISHING (THE RAINBOW)
29 ★Eric Burk, Williamsburg, NY
12 ●Kevin Oberborger, Sparks, NV
11 Brian Austin, New Salisbury, IN
11 Emily Doubl, Deep River, Ontario
10 Mike Cook, Dixon, IL
10 Michael Malfard, Wren, OH
10 Doug Schwartz, Glendale, AZ

GRABBER (Tom Mix)
147,500 ★Brian Foley, Blackstone, MA
129,100 Blossom Mayor, East Greenbush, NY
70,600 Michael Corman, Lafayette, IN
31,900 Stephane Asselin, Haurorve, Quebec
27,750 Eilan Bellinger, Uxbridge, Ontario

GROBOT (Children Computer Workshop)
14,340 ★Krisil Aniker, Terill, IA

HEIST (THE RAINBOW)
2,100 ★Sergio Waiser, Mexico City, Mexico
1,500 Julio Comallo, Scarborough, Ontario
1,500 Kirstia Compton, Sullfield, CT
1,500 Andy Dater, Medford, OR
1,500 David Figel, Sardis, OH
1,500 Joel Lombardi, Newark, DE
1,500 Jell Roberg, Winfield, KS
1,500 Brendan Smith, Coral Springs, FL
1,500 Kevin Spergh, Bridgewater, Nova Scotia

1,500 Rupert Young, Shellfield, MA

THE JUNGLE (THE RAINBOW)
11,330,797 ★Kannon Shanmugam, Lawrence, KS
870,333 ●Tony Boring, Armagh, PA
644,694 Mall Hazard, Columbia Station, OH
4,230 Doug Schwartz, Glendale, AZ
3,048 Jon Hobson, Plainfield, WI

JUNIOR'S REVENGE (Computerware)
4,897,000 ★Chills Oberholzer, Lexington, MA
3,007,000 ●Tim Brown, Clio, MI
2,154,900 Scott Kubola, Whitby, Ontario
2,099,300 Shawn McAlpin, Louisville, KY
1,220,000 Edwin Pralher, Oxnard, CA

KATERPILLAR ATTACK (Tom Mix)
31,672 ★Scott Fairfield, Williamsburg, MA
25,949 James A. Lalare, Williamsburg, MA
18,949 Vadim Golovaky, Toronto, Ontario
15,821 Alex Golovaky, Toronto, Ontario
5,631 Greg Erlesu, Columbus, OH

THE KING (Tom Mix)
10,000,100 ★Mark Smith, Santa Ana, CA
6,299,300 Scott Oberholzer, Lexington, MA

SCOREBOARD

4,040,300 Andy Truassdale, Ferguson, MO
3,343,000 Coray Frladman, Minnetonke, MN
2,410,200 Candy Harden, Birmingham, AL
116,200 Charla Salmon, Madison, WI

KLENDATHU (Radio Shack)
1,962,741 ★ Jay Pribble, Davenport, IA
1,245,821 John Sandberg, Concord, CA
1,193,350 Tommy Parker, Talladega, AL
1,182,685 David L. Ferris, Shickahinny, PA
827,500 Brad Lacerda, Gloucester, MA
541,700 Brett Fukumoto, Tass, Alberta

LASERWORD & FIREFLY (THE RAINBOW)
200,350 ★ Allan Ballard, Ft. Wayne, IN
116,622 ● Michael Rosanberg, Prastionburg, KY
94,748 Brian Chalm, Weyers Cave, VA
87,515 Merco Swinkels, Beneluxlaan, Netherlands
57,285 Chris Johnson, Carlisle, Parth, Australia
39,630 Mark Wells, Baxter, TN

LEMANS (Spectral Associates)
1:19 ★ Paul MacArthur, Gillette, WI

MEGA-BUG (Radio Shack)
60,000 ★ Robin Worthem, Milwaukee, WI
21,130 Richard Hansen, Inkom, ID
18,902 John Tillany, Washington, DC
15,999 Ed Mitchell, Ragged Mountain, CO
14,287 Aleisha Hemphill, Los Angeles, CA
9,691 Kannon Shanmugam, Lawrence, KS

METEORS (Spectral Associates)
186,570 ★ Mike & Dave Garozzo, Morrisville, PA
26,580 ● Kevin Erlich, Perry Hall, MD
16,870 Keith Marsh, Boca Raton, FL
15,660 David Bryan, Kentwood, LA
14,200 Craig Dutton, Goose Bay, Labrador

MICROBES (Radio Shack)
178,550 ★ Apollo Latham, Rich Square, NC
144,350 Theodore Latham Jr., Rich Square, NC
40,850 Joey Lewis, Cabin Creek, WV
30,850 Ronald Gotes, Grand Rapids, MI

MOON HOPPER (Computerware)
114,540 ★ Susan Ballinger, Uxbridge, Ontario
78,820 Brian Austin, New Salisbury, IN
59,970 Cole McDonald, St. Cloud, MN
53,570 Robert Heimon, Virginia Beach, VA

MR. DIG (Computerware)
2,301,000 ★ Jeff Roberg, Winfield, KS
1,976,500 Tim Magnusen, Lafayette, TN
1,392,100 John Latham, Saginaw, MI
886,700 Thomas Hartig, Boca Raton, FL
784,500 Marc Harris, Colorado Springs, CO

MS. MAZE (Tom Mix)
94,020 ★ Chu-Kia Wang, Madison, WI
64,120 Brett Johnson, Columbus, OH
42,240 Cheille Salmon, Madison, WI

MUDDIES (MachTron)
185,200 ★ Bertha Jellree, San Bernardino, CA
173,900 Andrew Chin, Austin, TX
164,000 Paul Baker, Pittsburgh, PA
158,800 Glenn Wasson, Castleton, NY
147,400 Chris Haley, Auburn, CA
137,300 Doug Seibel, Tumbler Ridge, British Columbia
68,400 Chris Young, Ft. Worth, TX

NINJA WARRIOR (Programmer's Guild)
151,100 ★ Douglas Rodger, Harvard, MA
106,900 Bud Seibel, Tumbler Ridge, British Columbia
105,200 Martin W. Grimm, Elkview, WV
102,400 Christophel Gelowitz, Claresholm, Alberta
86,100 Ryan Sambrook, Miami Lakes, FL
54,500 Chu-Kia Wang, Madison, WI

OFFENOER (American Business Computers)
113,000 ★ Kevin Marsh, Boca Raton, FL
103,450 Julio Comello, Scarborough, Ontario

PAC OROIDS (Programmer's Guild)
2,467,810 ★ Steve Schuljer, Hazel Green, WI

PAC 'EM (THE RAINBOW)
2,372 ★ Stephanie Gragory, Coco Solo, Panama
2,059 Ari Hartough, Ft. Wayne, IN

1,999 Kevin R. Hubbard, Huntington, WV
1,951 Dr. James Peterson, Redcliff, KY
1,870 Steve Olson, Calgary, Alberta
1,605 Kirtie Compton, Sullfield, CT

PAC-TAC (Computerware)
4,230 ★ David Bryan, Kentwood, LA

PARA-JUMPER (THE RAINBOW)
822 ★ Peter MacLeod, Montague, Prince Edward Island
783 Ronald Gotes, Grand Rapids, MI

PLANET INVASION (Spectral Associates)
177,900 ★ Russ Rosen, Cardiff, CA
67,300 Doug Seibel, Tumbler Ridge, British Columbia

POLARIS (Radio Shack)
281,341 ★ Nico Swinkels, Beneluxlaan, Netherlands
111,273 Scoil Deley, Biloxi, MS
91,168 Ed Meyer, Vancouver, British Columbia
81,041 Andy Lehlola, Mound, MN
75,280 Rich Ven Manen, Grand Rapids, MI
42,260 Brett Johnson, Columbus, OH
12,729 Matt Hazard, Columbia Station, OH

POLTERGEIST (Radio Shack)
★ Walker Astle, Grimsby, Ontario
Ray Suplae
Brad Lacerda, Gloucester, MA
Mall Hazard, Columbia Station, OH

POOYAN (DataSoft)
1,511,050 ★ Jill Connell, Winona, MN
1,383,500 Lori Haape, Hutchinson, KS
1,138,500 Linda Cola, Montreal, Quebec
890,850 Jerry Morgan, Independence, MO
480,450 Bernd Prueftling, Scheibenhart, West Germany
355,100 Mark Rodda, Springfield, VA
271,850 Jenny Peikesh, Warren, MI
232,650 Robert Ahlgrim, Hutchinson, KS
125,750 Chris Young, Ft. Worth, TX
107,000 Chris Cope, Central, SC
105,000 Ryan Van Manen, Grand Rapids, MI

POPCORN (Radio Shack)
64,380 ★ Susan Rushing, Tucson, AZ
57,860 Jeffrey Kochs, Giova City, OH
48,930 Paul Baker, Pittsburgh, PA
47,110 Darin Martin, Oakland, CA
46,900 Dan Rellenbaugh, Sandy Lake, PA
46,020 Christine Sabey, Kent, WA
37,950 Nathan Wallece, Waldorf, MD
37,720 Dele Morford, Kent, WA
22,800 Jon Clavenger, Lima, OH
22,330 Mike Harrison, Lima, OH
16,220 Chad Bunovich, Pittsburgh, PA
18,110 Layla Blackshear, Ft. Worth, TX

PROJECT NEBULA (Radio Shack)
1,600 ★ Dan Heater, Corland, OH
1,410 Brad Lacerda, Gloucester, MA
1,270 ● Theodore Latham Jr., Rich Square, NC
1,235 Joey Lewis, Cabin Creek, WV
1,145 Barry Logan, Pinckneyville, IL

PYRAMO (Radio Shack)
220/113 ★ John Dupra, Mobile, AL
220/130 Cornallus Caesar, Gundalhardistr, West Germany
220/130 George R. Fairlaid, Victoria, British Columbia
220/133 Robert Dickeu, Sacramento, CA
220/136 Andy Nelson, Winona, MN
220/137 Chris Cope, Central, SC
220/140 Kenn Booth, Grand Rapids, MI
220/140 Bob Dawill, Blue Island, IL
220/145 Robba Sablotny, Mt. Zion, IL
220/151 Randall Edwards, Dunlap, KS

Q-NEED (THE RAINBOW)
6,512,020 ★ Ray Ravalliera, Bathune, France
328,810 David Chabot, Granby, Quebec
181,920 Ray Suplae
Susan Bennington, Pensacola, FL
130,000 Robert Drckau, Sacramento, CA
6,200 Laura Goldberg, Monroe, CT

QUIX (Tom Mix)
708,206 ★ Wrb Mairifnew, Oshawa, Ontario
496,165 Evelyn Gagnon, North Bay, Ontario

RAAKA-TU (Radio Shack)
50 ★ Mike Bubb, Giallon, OH
50 ★ Chris Cope, Central, SC
40 ● David Joyner, Raleigh, NC
25 Brian Sobolewski, Orange Park, FL
20 Ronnia Wallenapenich, Sun Valley, CA

RAINBOW ROACH (THE RAINBOW)
283,500 ★ Andy Lahtiola, Mound, MN
212,700 Jon Kroll, Greendale, WI
148,800 Mark Wells, Baxter, TN
124,800 Charyl Endlich, Perry Hall, MD
122,700 Peter MacLeod, Montague, Prince Edward Island

REACTOIDS (Radio Shack)
931,395 ★ Linda Mobbs, Pl. Huron, MI
203,800 Andrew Lehlola, Mound, MN
161,245 Jall Loeb, Mobile, AL
88,815 Robble Anderson, Monrovia, CA
41,100 Jell Loeb, Mobile, AL

RETURN OF THE JET-I (ThunderVision)
389,453 ★ Gary Bachall, Huntsville, AL
208,602 Robert Buerkle, Conway, PA
188,000 Todd Kaplan, Lawrenceville, NJ

ROBOTTACK (Intracolor)
2,516,050 ★ Horace Hemillon, Calgary, Alberta
2,437,000 ● Mike Scharl, Fremont, OH
2,329,000 Edwin Prether & Cory Soper
2,216,950 Randy Hankins, Tabor, IA
1,922,200 Erk Merz, Noblesville, IN
145,100 David Mounl, West Monroa, NY

SANDS OF EGYPT (Radio Shack)
80 ★ Bob Dewill, Blue Island, IL
102 Chu-Kia Wang, Madison, WI

SHAMUS (Synapse Software)
72,000 ★ Todd Kaplan, Lawrenceville, NJ
17,185 Paul MacArthur, Gillette, WI

SHOOTING GALLERY (Radio Shack)
149,940 ★ Robert Wallace, Waldorf, MD
67,700 Vernell Peterson, Radcliff, KY
44,870 Mark Nichols, Birsay, Saskatchewan
44,480 R. Duguay, St. Bruno, Quebec
35,080 Greg Erieau, Columbus, OH
10,340 Layla Blackshear, Ft. Worth, TX

SKIING (Radio Shack)
05,85 ★ John Hopkins, Greenville, SC
12,02 Brian Austin, New Salisbury, IN
12,08 Kelly Kerr, Wentzville, MO
13,73 Janell Strohane, Ashland, WI
21,35 Jean-Claude Tallana, Brossard, Quebec

SKRAMBLE (Tom Mix)
48,440 ★ Steve Schuljer, Hazel Green, WI

SLAKER (THE RAINBOW)
1:26 ★ Dan Sobczak, Mesa, AZ
1:59 Barju Shah, Deep River, Ontario
2:21 Eric Burk, Williamsville, NY

SPACE INVADERS (Spectral Associates)
47,870 ★ Donald Williams, Prince George, British Columbia

SPIDERCIDE (Radio Shack)
1,700 ★ Doug Fainstein, Mobile, AL
1,400 Joel Feinstein, Mobile, AL

STARBLAZE (Radio Shack)
11,000 ★ Steve Schuljer, Hazel Green, WI
9,700 Robba Sablotny, Mt. Zion, IL
9,050 Mark Wells, Baxter, TN
8,250 Ronnie Wallenapenich, Sun Valley, CA

STAR TRADER (Computerware)
43 days ★ Steve Hartford, Glendale, CA

STELLAR LIFE-LINE (Radio Shack)
33,100 ★ Kenn Booth, Grand Rapids, MI

TIME BANDIT (MachTron)
413,620 ★ Doug Seibel, Tumbler Ridge, British Columbia
243,620 ● Mark Wooga, Omaha, NE
225,950 Chils Obetholizer, Lexington, MA
214,850 Sally Naumann, Hella, ID
129,240 Brian Larsson, Fridley, MN
103,380 Rodney Mullineux, Gig Harbor, WA

MORE... RAINBOW SCOREBOARD

43,370 Jon Kroll, Greendale, WI
41,340 Chad Barry, Rochester, NH
TOUCHSTONE (Tom Mix)
88,300 ★Michael Mafford, Wren, OH
65,520 ●Kevin Marsh, Bokeelia, FL
TRAILIN' TAIL (THE RAINBOW)
87,345 ★Philip Parant, Smiths Falls, Ontario
75,275 ●Michael Rosenberg, Prestonsburg, KY
74,395 Jean-Marc Parent, Smiths Falls, Ontario
33,454 Kenneth Baerham, Lawton, MI
26,840 Or. James Peterson, Radcliff, KY
TRAPFALL (Tom Mix)
120,406 ★Keith Marsh, Bokeelia, FL
114,642 Eric Lecroquer, Orléans, Ontario
114,322 David Joyner, Raleigh, NC
113,408 Rich Trawick, N. Adams, MI
112,598 Kent Dinde, Kingston, Ontario
109,588 Ryan Van Manen, Grand Rapids, MI

TRIPLE YAHTZEE (Software Factory)
2,474 ★Robert Larson, Belfair, WA
TUT'S TOMB (Mark Data)
163,060 ★Michael McCafferty, Oceanside, CA
158,000 Chris Russo, Miami, FL
121,240 Mickey McCafferty, Oceanside, CA
106,460 Eileen Kaakee, Royal Oak, MI
104,360 Gary Marshall, Layton, UT
79,780 Rodney Mullineaux, Gig Harbor, WA
39,920 Tom Loring, Bridgewater, MA
WACKY FOOD (Arcade Animation)
241,200 ★Todd Kaplan, Lawrenceville, NJ
227,900 ●Jon Jenkins, Milner, GA
105,100 Stephen Asselin, Hauteville, Quebec
WHIRLYBIRD RUN (Spectral Associates)
516,450 ★Dan Sheigel, Arroyo Grande, CA

283,100 Nathan Russell, Minco, OK
174,750 Georgia Hoffman, Shavertown, PA
157,000 Hughes Allen-Alme, Montreal, Quebec
104,000 Jeff Connell, Winona, MN
ZAXXON (DataSoft)
2,057,800 ★Chris Oberholtzer, Lexington, MA
1,510,000 ●James Oudrella, Brooklyn, NY
686,000 Andy Green, Whitehall, PA
401,900 Mike Hughey, King George, VA
370,400 Chris Coyle, Selden, NY
182,700 Brant Putnam, Tucson, AZ
114,000 Kannon Shanmugam, Lawrence, KS
111,100 Liz Baker, Marissa, IL
100,700 Ronald Gelas, Grand Rapids, MI
73,400 David Bryan, Kentwood, LA
73,000 Briton Rothrock, Roanoke, VA

— Tamara Solley

SCOREBOARD POINTERS

In conjunction with THE RAINBOW's Scoreboard, we offer this column of pointers for our game-playing readers' benefit. If you have some interesting hints and tips, we encourage you to share them by sending them to the Scoreboard, c/o THE RAINBOW.

'LOOP'-HOLE

Scoreboard:

Here's a tip for playing *Draconian*: *EXECuting* a quick loop will sometimes fool the birds into leaving the screen. Also, when in the higher numbered sectors (five through nine), it is best not to waste time picking up the bonus men until all the prisons are destroyed.

I'm really stumped on *Shenanigans*. I've reached the lady and the snake and I don't know how to pass them. Please write me at 1366 Beverly St., 95521.

Peter Kral
Arcata, CA

Scoreboard:

I have solved *The Amazing Adventures of Karrak*, (THE RAINBOW, Feb. '84). Here are some clues: First, LOOK in SACK, GET POUCH, OPEN POUCH and GET COIN. Then, PUT COIN (it will ask where) and type SLOT.

For the "ball with the holes," THROW SACK (it will ask for a direction) type 'N'. This will help you get through most of game one.

If you have any more problems with *Karrak*, or other Adventures such as *Black*

Sanctum or *Shenanigans*, or can offer help with *Sea Quest* or *Aardvark's Pyramid 80*, please write me at 3426 Airway Ave., 63114.

Denise Blackwell
St. Louis, MO

LAMENTING THE WIZARD

Scoreboard:

I am having trouble with the Adventure *Keys of the Wizard*. How do you kill anything? I have played the Adventure over a hundred times, but to no avail. Please help me!

If there is someone who needs help with the Adventure *Calixto Island*, I have all the answers. Write to me at 96 Lions Dr., 19067.

Michael J. Garozzo
Morrisville, PA

DUNGEON DELIVERANCE

Scoreboard:

I have completely solved the Adventure game *Dungeons of Daggorth*. If there is anybody out there who needs help with the magic words needed to incant rings, killing monsters, maps of the five levels or anything else about the dungeons, please send a SASE

to 19930 Garnett Court, 95070, and state your problem. I will return your letter as soon as possible. I also need to know where the chest is in *Pyramid*, and would greatly appreciate it if someone could tell me.

Allan Schaffer
Saratoga, CA

TIME WARP

Scoreboard:

I've found that while playing the game *Lancer* you can stop the action (create a pause) by pressing BREAK. You can resume the action by pressing Q, W and the SHIFT keys at the same time.

Also, if you push the SHIFT key and the @ key at the same time when it asks for the player's name, the words "double speed" appear at the bottom of the screen; the game will run a little faster.

Ricky Susfalk
Grand Island, NY

RAINBOW TRIO

Scoreboard:

I have solved three Adventures by THE RAINBOW. They are: *Enrak* (Aug. '83), *The*

Crown of Merro (Feb. '84) and *The Arconia Assignment* (July '84). I have made maps for all of these Adventures. You can write me at 641 N. Dawn Circle, 85203. I will send you a map for each Adventure.

Dan Sobczak
Mesa, AZ

NEBULOUS DILEMMA

Scoreboard:

I am having trouble with the game *Project Nebula*. I can't figure out how to dock with the space station. If anyone could help, I would be very grateful. You can write me at 856 Hancock Rd., 63385

Kel Kerr
Wentzville, MO

BASE BURGLARY

Scoreboard:

I have a suggestion for stealing home base when playing against the computer in the game *Baseball*: Try stealing it *before* the pitcher throws the ball.

Stephen Blazek
Gainesville, FL

SANCTUM SANCTION

Scoreboard:

If anyone has had any trouble in getting tools from the caretaker in *Black Sanctum*, send a SASE and I will be glad to help.

I need help in getting past the pit and the slot in game one of *Karrak*. If you can help, write me at 4009 32nd Ave. Ct. NW, 98335.

Rodney Mullineaux
Gig Harbor, WA

TU CLUES FOR COMFORT

Scoreboard:

I have some clues for *Raaka-Tu*. To kill the gargoyle, use the poisonous candle. To get out, GO UNDER the altar. After you get out, if you have 25 points, go west twice and north three times, then you will have 50 points.

For those of you who need help on *Bedlam*: when you get in the hall go west all the way until you get to the room where the hook is, get it and go to the cabinet and get the red key with the hook; go outside the shack room and get the green key with the hook. To get out, go out the painted door or use the green key to get out of the storage room.

If anyone can give me a map or some clues to *Sands of Egypt*, please write me at Rt. 1, Box 575, 75124.

Bryan Petray
Eustace, TX

Q-SHORTY

Scoreboard:

I have found a way to make *Q-Nerd* shorter (THE RAINBOW, May '84). There are two pyramids; both parts are the same except there isn't a Q-Nerd on the bottom pyramid.

In Line 11 — Add a SCREEN 1,0 at the end of the line.

In Line 14 — Delete IF YP=0 THEN SCREEN 1,0 at the end of the line.

In Line 16 — Delete SCREEN 1,0 at the end of the line.

In Line 50 — Delete both SCREEN statements at the end and beginning of the line.

In Line 55 — Delete SCREEN 1,0 in the beginning of the line.

Tim Magnusen
Lafayette, IN

TRADING IN

Scoreboard:

I am the happy owner of a 64K CoCo 2 and I am looking for anyone who wishes to trade data tapes for *Dungeons of Daggo-rath*. My address is General Delivery, 38915.

A. Jason Collins
Bruce, MS

S.O.S.

Scoreboard:

I need help on the non-graphics version of *Mars*. I can't figure out any of Part I. Please help if you can. My address is 1512 Ransom Dr., 32780.

Jason Magoon
Titusville, FL

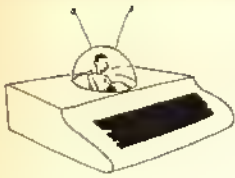
Scoreboard:

I had a letter in "Scoreboard Pointers" in the Sept. '84 issue of THE RAINBOW regarding several solutions to Adventure games. Since then, there have been some changes made. My phone number is now (904) 785-1599. The list of Adventures I have answers to now is: *Sands of Egypt*, *Pyramid*, *Raaka-Tu*, *Calixto Island*, *Black Sanctum*, *Sea Quest* and *Shenanigans*.

If you aren't familiar with the offer, I give complete solutions to those Adventures listed above for \$1. Also, if you only need one or two clues, send a SASE and I'll answer, if possible. Send all mail to 2402 Pretty Bayou Drive, 32405.

Ryan Elam
Panama City, FL





The Death Of A Computer... Not Quite

By Ed Ellers
Rainbow Technical Writer

I'm very disappointed in [your claim of being] for both CoCo and the MC-10 because it seems that everything you've put in (advertising, programs, hardware, games, etc.) is for the CoCo and not the MC-10. I mean, only some articles are for the MC-10, like one or two programs not off-hand games or one chess game. What about hardware? There are no printers, adapters, disks or anything else being advertised for the MC-10. I know graphics capability and memory are limitations, but there's got to be something out there!

Mark Foster
Whitney, TX

There are quite a few BASIC programs listed in THE RAINBOW that will work on the MC-10. Your machine has a very close copy of Color BASIC, and nearly all of the same BASIC functions are available. If a program is listed for Color BASIC (no "ECB" in the key box), doesn't use joysticks or tape data files, has no PEEKs and POKEs (you have the statements, but memory locations are very different) and doesn't need machine language driver programs to work (they won't run as is on the MC-10's 6803 microprocessor), you can use it. You may need a 16K memory expander to run the longer ones; Radio Shack carried this as 26-3013, and your local stores may still have them in stock.

As for hardware, any printer (as far as I know) that works on the CoCo will work on the MC-10, but you can only operate it at

600 Baud; the CoCo can drive a printer at 9600 if the printer and/or interface box can take it. Modems will work as well; Radio Shack sells the Micro Color Compact terminal program, and at least one of our advertisers has an MC-10 "term" program. Those two are about the only peripherals I can think of that would be used on an MC-10 (other than the 16K RAM pack).

The reason that you see very little MC-10 material is that there's very little to print. The people who bought and used the MC-10 were largely newcomers to computing who didn't intend to do a whole lot of programming; conversely, the real "hackers" generally passed it up in favor of the CoCo's greater capabilities. With the MC-10 now officially out of the Radio Shack line, I'm afraid that this trend will continue. The CoCo's price has now come down to less than what the MC-10 and a memory expander sold for originally, so you may want to get one.

If you want some technical information on the MC-10, you might try going through the August, September and October 1983 issues of THE RAINBOW and the October 1983 Hot CoCo.

How and "Y"

- How does a Y-adaptor work?*

Kevin Marsh
Bokelia, FL

It simply lets you hook two devices up to the CoCo's cartridge slot at once. Some of them simply run all of the lines in parallel, so you can only have one device that has a ROM (such as a disk controller), while others have a switch that selects the ROM in one or the other cartridge and blocks out the other.

Unattainable Beauty...

- I've seen some terrific graphics displays on RGB monitors used with some of the other personal computers. I know about the advantages of RGB monitors as opposed to regular video monitors; is there some way to connect them to the CoCo?*

Jerry White
Chryslant, OH

It would be rather difficult to do; the CoCo's 6847 graphics generator chip puts out three signals called Y (the equivalent of a black-and-white signal, which many monitor adapters use) and two "difference" signals called R-Y and B-Y. The MC1372 encoder converts the difference signals into a chroma "subcarrier" and adds that to Y to create the composite color signal. To get R, G and B you would have to have a matrix circuit to recover the original red, green and blue signals, and you would then have an "analog" RGB signal instead of the digital RGB output that most monitors are designed for. You might try using one of the newer monitors that have both RGB and composite inputs; one example is the Panasonic CT-1300D (soon to be replaced by the CTF-1495M). This type of monitor has the kind of resolution that RGB displays require, but provides much the same benefit when using composite video.

Genie Bottleneck

- We would like to know if the software used on the CoCo is usable on our Colour Genie EG 2000 from EACA Computers of Hong Kong. We will be grateful for your reply.*

Allen N. Leonard
Electric Control Equipment Company
Mumbai, India

(Ed Ellers, a RAINBOW and PCM staff member, is a self-confessed electronics fanatic whose other interests include science fiction.)

The Colour Genie (which is sold primarily in Europe; it hasn't reached the United States that I know of) is a color version of the older Video Genie, a copy of the TRS-80 Model I that was also sold as the TRZ-80, PMC-80 and Dick Smith System 80. From what I've gathered, the Colour Genie is a Model I-type machine that has little in common with the CoCo, so CoCo software won't work on it.

Wear And Tear

• *I have a problem that I think many owners of the older gray CoCos may have. The front of my CoCo's case is scratched from leaving my hands on it. It really looks terrible. I called Radio Shack, but all they said was to get paint from somewhere to touch it up. I tried that, but it doesn't work at all. To top this off, my spaw bar sticks from having played so many games. Now my CoCo looks terrible and the spaw bar hardly works. Is there any type of shield (a shirk one) I could buy, or does anyone make a paint that matches the CoCo? And is there something I could do to fix my spaw bar?*

Steven Listonall
Baltimore, MD

On the wearing-away paint job, I'm told that the best paint is an automotive touch-up paint in Mercedes silver-gray(!). Try an auto parts store for it. You might also take the top off, remove the color Computer nameplate (it peels off) and the RAM button (pry up two tabs on the underside), then after you apply the paint to the worn areas, spray the whole top with a clear acrylic spray (such as Krylon). Two or three clear coats should protect the paint.

As for the sticking keys, the only real fix is to take apart the keyboard and clean the parts. This is not something I recommend

lightly, as there are twenty-one tiny screws that have to be removed, and the switches are actually fifty-three little springs. Don't try it unless you really know what you are doing.

... And Cleaning Up The Trash

• *Our new CoCo has given a rotten picture since the day we got it. Interference shows up on the screen and just won't quit. Is there anything we can do about it?*

Philip Hohn
Louisville, KY

Your TV set may have a special 75-ohm coaxial cable jack if it is a color model and is cable-ready (or in many cases, even if it isn't; I've seen this on \$170 jobs from Taiwan). It's very easy to plug the CoCo directly into this jack, using an adapter like Radio Shack's 278-255 to connect an RCA-type phono plug in an F-type connector. In many cases, this will clear up the interference. You may have to use, instead of the adapter, a new coaxial cable with an adapter such as the Radio Shack 278-252 to go directly to the CoCo and get rid of its own output cable. I'm using a coax cable with an 'F' connector on one end and a phono plug on the other, and have no trouble even with two computers operating in the room. Sets with two channel selector knobs (one for VHF and one for UHF) may not provide the best results because of insufficient shielding; cable-ready sets as a rule are well shielded to prevent interference problems in cable TV.

The Lock-Up

• *Shortly after the warranty expired (of course!) the computer started to lock up. Sometimes a second cursor will appear, and other times the letters or numbers in column two and 10 change in different lines; the cursor disappears and the keyboard does*

nothing. I always have to turn the computer off and hook up to regain control.

John Friesen
LaSalle, Manitoba

This is one of the most difficult problems to cure; when it happened in a CoCo belonging to one of our staff members here at THE RAINBOW, Radio Shack's technician ended up replacing the entire circuit board. The changing characters seem to point to RAM problems. If you can get a RAM test program (like Radio Shack's Diagnostics cartridge), put it in and leave the computer running; if any bad bits show up, replace the appropriate chips. This may well be a permanent cure. (If you only have 16K, you might want to go ahead and install a set of 64K RAM chips if one or more of your original set is bad.)

Something Old, Something New

• *I recently purchased a disk drive system from Radio Shack; the unit I received fits the CoCo 2 and not the earlier model. I was told that Radio Shack had modified the controller so it would work on my 'E' board machine.*

I would like to know if another company makes a disk drive that will work on my computer, because the Radio Shack salesman in Chicago whom I spoke with said that the disk system for my computer is no longer being made and that there are no other systems of this type (catalog number 26-3022) in stock in Illinois or Indiana.

Edward Wolak
Chicago, IL

There should be no problem using the newer disk system with your computer. The new controller works fine on the older machines; we confirmed this here at THE RAINBOW office.

GEMINI 10X COMPLETE SYSTEM

Gemini 10X

PRINT SPEED—120 cps. Bidirectional Logic Seeking

PRINT SIZE—10, 12, 17, 5, 6, 8.5 cpi

NUMBER OF COLUMNS—80, 96, 136, (40, 48, 68 in Double Wide)

CHARACTER MATRIX—9 x 9 Standard, with True Descenders • 18 x 9 Emphasized • 18 x 18 Double Strike • 6 x 6 Block Graphics • 60 x 72 Low Resolution, Bit Image Graphics • 120 x 144 Hi Resolution, Bit Image Graphics • 240 x 144 Ultra Hi Resolution, Bit Image Graphics

CHARACTER SETS—96 Standard ASCII Characters • 96 Italics • 64 Special Characters • 32 Block Graphic Characters • 96 Downloadable Characters • Super and Sub Script

LINE SPACING—Programmable by n/144"

PAPER HANDLING—Roll Paper • Cut Sheet • Tractor Fanfold • Copies: 3 Carbonless Sheets

ONE YEAR WARRANTY

*Serviceable at over 4000
Locations Coast to Coast*

SUPER GEMPRINT

A Full 8x11 Screen Dump Program

- User definable color shading
- Prints all 5 Pmodes
- Machine language position independent code
- Tape transferrable to disk

COMPLETE — NOTHING MORE TO BUY — INCLUDES:

- GEMINI 10 X PRINTER
- SUPER GEMPRINT
- BLUE STREAK INTERFACE
- DELUXE MANUAL

299⁹⁵ + \$10 SHIPPING
AND INSURANCE
15X SYSTEM 439.95

BLUE STREAK ALONE — 54⁹⁵ SPECIFY PRINTER

THE BLUE STREAK

Serial to Parallel Interface

SLEEK—1"x2"x4" Optional AC Supply plugs into side - AC not required with most printers

FAST—300 to 9600 Baud - 30% faster than the standard 9600 Baud Interface.

STRONG—Built sturdy with jacked cable, strain reliefs and highest quality components.

- Complete with ALL cables and connectors
- 180 Day Warranty



COMPLETE DATA COMMUNICATIONS PACKAGE

VOLKSMODEM™

Connects directly to wall phone jack

- Telephone jack with voice/data switch • 300 Baud (bits per second)
- Originate/answer mode automatically selected • Battery powered.
- Low drain for long life (batteries included) • Lifetime warranty
- Includes all cables for COCO

AUTOTERM™ by PXE Computing

"Best of Class" - Randolph Graham Rainbow
Highest Ratings by Hot CoCo

"A Cut Above" - Wayne Day Color Computer

Includes subscription to
THE SOURCE. Limited Time Offer
May Not Be Available.

VOLKSMODEM
with
Cables

69⁹⁵ + \$2 S&I

VOLKSMODEM
AUTOTERM
(TAPE)

99⁹⁵ + \$2 S&I

VOLKSMODEM
AUTOTERM
(DISK)

104⁹⁵ + \$2 S&I

DAYTON ASSOCIATES, INC.

STAR AUTHORIZED DEALER • DUN & BRADSTREET LISTED
7201 CLAIRESBOLD BLDG. C • DAYTON, OHIO 45424

(513) 236-1454

OHIO RESIDENTS ADD 6% SALES TAX
C.O.D. ADD \$2.00



RAINBOW REVIEWS

Ancestors 2.0	
Chart Your Family Tree/Autumn Color Software	218
Autoterm	
A Multi-featured Terminal Program/PXE Computing	229
CoCo Dump	
'Close To Perfection'/Spectrum Projects	230
Color Finance II	
Manages Your Chacking Account/Delkar Electronics, Inc.	208
Color Stronghold	
An Interesting Game Of Survival/MichTron	243
Concordance	
An Aid To Programming Development/Echo Soft	200
OEFT Bench And DEFT PASCAL	
Improved Software Workbench/DEFT Systems, Inc.	221
Disk VIDTEX	
New Advantages Possibla/CompuSarva	235
Easy-File	
A Good Data Management System/Mark Data Products	240
Erland	
A Complex, Challenging Simulation Game/Prickly-Paar Software	204
Evasion	
Elusive Adventure/Pai Craations	216
Fangman	
Good Guys And Bat Guys/Tom Mix Software	242
First Games	
Educational Fun For Pre-Schoolers/Computer Island	220
Full Screen Editor	
Upgrade Your DOS/DSL Computer Products	236
Gray Lady	
Command The Briny Depths/Jarb Software	219
Hands On	
'Outstanding' Educational Software/Radio Shack	206
Hayes Mach II Joystick	
A First-Class Performer/Spectrum Projects	244
K-BASIC	
A Better System Environment/Lloyd I/O	226
Kingdom Of Bashan	
For The High-Spirited Adventurer/Owls Nast Software	211
Learning Games	
A Three-Program 'Classroom'/DD Software	241
Masterfile	
Masters Your Files/Sofga Entarprisas	212
Miner	
Blast Those Mines/The Dataman	232
Mr. Dig	
Keeps You Picking And Grinning/Computerware	238
Music Library 100	
A Notable Program To Make CoCo Sing/Spaach Systems	225
Personal Bookkeeping 84	
Keeps Track Of Your Accounts/AMDT-STAR DANCERS	214
Pilgrim's Progress	
A Good, Religious Adventure/Quality Christian Software	213
Pirator	
Protect Your Software/Sugar Software	234
Quizspin	
An Appealing Game For Adults And Children/Spectral Associates	229
Spell-N-Fix II	
A Quality Spelling Checker/Star-Kits Corporation	232
Teacher's Pet	
For Roll And Grade Books/Aurora Computing	205
The Zapper Family	
Creates Bar And Pie Charts/Southern Software Systems	223

**SEND
FOR FREE
CATALOG**



**Dealer
inquiries
invited**

ABC'S IN COLOR

In the ABC program, all 26 letters spring up in color to the familiar ABC tune. Then, colorful detailed pictures depicting each individual letter of the alphabet appear one by one. Your child's fascination will mount as he or she correctly presses the letter on the keyboard and is rewarded with a musical tune before the next detailed picture is drawn line by line onto the screen: AIRPLANE for A, BUS for B, CLOWN for C and so on to ZEBRA for Z. Truly a must program for the preschool to first grade age group!

CoCo 16K ECB Tape: \$19.95 Disk: \$25.95



CRISS—CROSS MATH

As the program begins, your child is presented with a nine square playing board. It is your choice as to which square you choose. After a choice is made, a MATH PROBLEM appears in the square. You score your first X by answering the problem correctly. If your answer is incorrect, the square clears and your opponent is allowed his choice of squares. The game is over when three squares vertically, horizontally, or diagonally are won by the same player. When playing against the computer, every answer you get wrong is won by the computer. Multi-level ADDITION AND SUBTRACTION program.

CoCo 16K Tape: \$12.95

FRACTIONS

SIDE ONE: Fraction Lessons, explains fractions with the aid of graphics. Child studies the different ways fractions can be represented. Lessons include:

- IMPROPER FRACTIONS
- MIXED FRACTIONS
- PROPER FRACTIONS

Many educators have praised the use of motion and color to display the fractional equivalents.

SIDE TWO: Fraction practice, offers a random computer generated quiz.

Atari 16k Tape: \$19.95
CoCo 16k Tape: \$19.95

JOYSTICK DRAW

Joystick Draw is the simple way to explore your artistic talents! Program operation is easy enough for a child to use, but effective enough that TCE uses it to design many sophisticated high-resolution graphic screens. Joystick Draw's design allows you or your child to save those masterpieces for future revisions or for use in other programs (instructions included). Your child will spend many hours enjoying this program and at the same time improving his or her eye hand coordination! You will find Joystick Draw to be an easy way to design those more sophisticated graphics for your own programs!

CoCo 16K ECB Tape: \$16.95



**Additional Educational Software available
for Color Computer, TDP 100, Atari[®],
Apple[®], Commodore 64[™], and VIC 20[™]**



SPELL BOMBER

As captain of your ship, you must destroy the enemy bomber by spelling the mystery word. In this exciting and educational game the bomber gets closer with each inaccurate letter. You have only EIGHT tries to guess the mystery word or your ship will be bombed! If you guess the word correctly, GENERAL QUARTERS will sound and your ship will fire a missile to destroy the bomber. Three levels are available: EASY, MEDIUM, and HARD. Challenging for all ages!

Atari 16K Tape: \$18.95
CoCo 16k ECB Tape: \$18.95 Disk: \$22.95
Vic 20 13k Tape: \$18.95

SPELLING BEE

The word is pronounced vocally and it is up to you to type in the correct spelling. If wrong, the computer will be your friend and flash the word on the screen for just an instant. OK! Try typing the word in again. STILL WRONG! The computer wants success and allows you to see the word again this time a little longer. If you just can't spell the word, the computer realizes you need to learn to spell the word and leaves the word on the screen for you to copy. Try your best and the computer has a surprise for your reward!

SPELLING BEE I GRADE 1 & 2 SPELLING BEE III GRADE 5 & 6
SPELLING BEE II GRADE 3 & 4 SPELLING BEE IV GRADE 7 & 8
CoCo 16k ECB TAPE: \$16.95 Each

TC—INVENTORY

Many insurance companies offer a discount for policy holders which have complete inventories on file. TC — Inventory is designed to help you organize, maintain, and compile the personal belongings of your home. Program is user friendly and menu driven. TC — Inventory allows input for location of item, price of item, serial number of item, date of purchase, and a text written description of the item. Don't put off recording your personal belongings until it's too late. Requires printer for hard copy.

CoCo 32k ECB Tape: \$16.95

TEACHING CLOCK



Torn between teaching time on a digital or a conventional (face and hands) clock? Well, this program combines the two using high resolution graphics and prompts! Your child will learn to tell time with the aid of a specially designed CLOCK! Child enters the time, if wrong, the center of the clock displays a graphic aid. If the child is correct a musical reward is heard. Program offers three levels: hours, quarter hours, and live minute intervals.

Apple 48k Disk: \$19.95
Atari 32k Tape: \$16.95
CoCo 16k ECB Disk: \$19.95 Tape: \$16.95

P.O. Box 2477 Gaithersburg, Maryland 20879 (301) 963-3848

RECEIVED & CERTIFIED

The following products recently have been received by THE RAINBOW, examined by our magazine staff and approved for the *Rainbow Seal of Certification*, your assurance that we have seen the product and have ascertained that it is what it purports to be. This month the *Seal of Certification* has been issued to:

Educational Simulations, a package of educational games. *Image Processing* allows the user to process and enhance images; *Strategy Football* makes the user the coach, quarterback and defensive signal caller of a football team; *Strategy Politics* is a Simulation of a presidential election; *Strategy Boxing* makes the user the coach of the U.S. Olympic Boxing team; and *Strategy Investing* is a simulation of the stock market from the point of view of investors. Ankia Research, 901-19 Indiantown Road, Suite R, Jupiter, FL 33458, disk \$69.95

Mathematics Program, a passel of 32K math programs. *Function Finder* finds the mathematical function that expresses a set of numbers; *Calculus* performs integration and differentiation; *Equation Evaluator* solves two forms of equations, the polynomial and/or set of linear equations; and *Matrix Math* allows calculating the determinant, the inverse, addition, subtraction and multiplication of matrices. Ankia Research, 901-19 Indiantown Road, Suite R, Jupiter, FL 33458, disk \$44

Professional 3-D Plotter, a 32K ECB program that produces a three-dimensional plot of a 32 x 32 data set with hidden line removal. The program allows adjustable scaling of data, adjustable aspect ratio (the "look-angle") and cassette or disk I/O. Ankia Research, 901-19 Indiantown Road, Suite R, Jupiter, FL 33458, disk \$24.95

Spectrum Analyzer, a 32K ML Fourier transform that calculates the frequency spectrum of a data set. It is designed for the user to examine the properties of a Fourier transform and operate on the data or functions inputted. Ankia Research, 901-19 Indiantown Road, Suite R, Jupiter, FL 33458, disk \$24.95

BBS Log Book, helps you keep track of your phone calls and related information when accessing Bulletin Board Systems. Included are sections to record long-distance calls and a personal directory to help you logon faster, remember your password and access numbers. Atmospheres, 1207 Eighth Ave., Brooklyn, NY 11215, \$5.95 plus \$2 S/H

FLEX Color Connection, a FLEX utility that allows access to a multitude of multi-user computer systems like CompuServe and The Source and single user bulletin board systems, as well as connecting two Color Computers together. Computerware,

Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, disk \$49.95 plus \$2 S/H

Color Connection, an OS-9 utility which allows access to a multitude of multi-user computer systems like CompuServe and The Source and single user bulletin board systems, as well as connecting two Color Computers together. Computerware, Box 668, 4403 Manchester Ave., Suite 102, Encinitas, CA 92024, disk \$49.95 plus \$2 S/H

PP Color Dump Version 2.0, a 32K ECB ML program that requires a CGP-115 printer plotter and is menu-oriented. Features include: single keystroke commands, double-sized printouts and ability to work in all PMODEs. Derby City Software, 3141 Doreen Way, Louisville, KY 40220, cassette \$19.95 plus \$1.50 S/H

GTRM, an OS-9 Hi-Res Screen and Window terminal program that is transparent to OS-9's operation, and reformats the screen for 24 rows of 51 characters, with true upper- and lowercase characters. Effective editing of block structured languages is possible with enough characters per line so that indentation can be utilized to illustrate the structure of a program module. Dugger's Growing Systems, P.O. Box 305, Solana Beach, CA 92075, disk \$34.95

SOLVE, (Symbolic Object/Logic Verification and Examination) an OS-9 debugging tool for testing errant software, which has monitor-like commands to work at the lowest level, full assembler and disassembler that allow symbolic operations. *SOLVE* single steps a program, executes it real-time with breakpoints or simulates it with conditional traps for solving errors. All levels of operation allow symbols as part of the expressions required for command. Dugger's Growing Systems, P.O. Box 305, Solana Beach, CA 92075, disk \$99.95

Test Manager, a 32K disk-based multiple choice test maker that requires a printer and creates, edits and mixes question files of up to 150 questions and answers. These files can be printed in order or randomized. An answer key is printed in the same order that the test is printed. 80 Custom Software, 5720 Brooke Lane, Sylvania, OH 34560, disk \$29.95

ElectraGuard, a solid state protector that performs a "life-guard" function by sup-

pressing transient voltage surges which may damage sensitive equipment. Howard Medical Company, Box 2, Chicago, IL 60609, \$16.25 plus \$2 S/H

B-XREF, an OS-9 utility designed to create a sorted cross reference of a BASIC09 program. All variable names, data types, procedure names and label references will appear in the cross reference along with line numbers in which the variable or line number is referred. The report may be directed to any valid OS-9 device or file. Interactive Micro Systems, P.O. Box 21007, Columbus OH 43221, disk \$19.95 plus \$2 S/H

KEY-WIZ, an OS-9 utility which permits databases containing textual information to be stored, searched and sorted according to a profile of keywords which are specified along with logical operators. Interactive Micro Systems, P.O. Box 21007, Columbus, OH 43221, disk \$24.95 plus \$2 S/H

Space Frame, a 16K engineering program which uses the finite element technique that divides structures into mathematically manageable units. This technique uses a banded matrix reduction routine to analyze structures to determine stress, strain and force. Kage Engineering, P.O. Box 3010, Lakewood, CA 90711-3010, cassette \$50.00

SGS, a 5.5K Semi-Graphics Support utility system that allows for easy-to-use graphics commands from a BASIC program. Circles, lines, rectangles, coloring (up to eight colors), animation effects and user-created sounds are possible from ECB or Disk BASIC programs. Micro Computer Systems, 1404 Sunset Drive, Friendswood, TX 77546, cassette \$24.95, disk \$34.95

Talking Adventure Starter, a 16K ECB program that consists of two separate and complete Adventures. The first, called *MY-HOUSE* is a simple Adventure with no serious pitfalls. The second, called *PI-RATES* is a harder Adventure, but help is available if you get stuck. Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363, cassette \$17.95

PERMFLAW, will mark as flawed any bad areas of a Color Disk BASIC disk. The several sectors that Disk BASIC does not use in the directory track will be ignored by *PERMFLAW* regardless of flaws. Any other error detected in the directory track will cause *PERMFLAW* to abort with a message stating that the disk cannot be used by Disk BASIC. A *PERMFLAWed* disk cannot be used as a destination disk on a backup. Joseph M. Schind, 8703 Coiswald Dr., Louisville, KY 40258, \$13.95

Pengon, a 16K Color BASIC ML adaptation of "Pengo" requiring one joystick. The object of the game is to move your penguin around the playing field and collect the

magic ice cubes. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette \$24.95, disk \$27.95

Szygy, a 32K ECB ML arcade game requiring joysticks. You are trapped aboard the Deathstar. Darth Vader has your light saber and the means to thwart your every avenue of escape. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette \$24.95, disk \$27.95

Crystal Castles, a 32K ECB arcade game requiring two joysticks. The objective is to control Bently the Bear's rampage through enemy castles as he gathers loot. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette, \$24.95, disk \$27.95

Color Panic, an ML adaptation of the arcade game "Space Panic" requiring 32K and two joysticks. Your mission is to stay alive on a planet filled with zombie-like mutants who are bloodthirsty from playing too many space arcades. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette \$24.95, disk \$27.95

QIKS, a 32K arcade game requiring joysticks. The method of play involves controlling a marker and blazing a trail as you avoid deadly sparx, qixs and fuses. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette \$24.95, disk \$27.95

Star Spores, a 32K arcade game requiring joysticks, that pits you against invaders from the galaxy Nastira. The Nasties are only vulnerable upon a waking from cryo-sleep. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette \$24.95, disk \$27.95

Devious, a 32K arcade game requiring two joysticks. The objective is to blast every thing in sight: the ships, the ground bases and the mother ship. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette \$24.95, disk \$27.95

G'NT (Graphics and Text), a 32K ECB graphics utility that gives the capability of intermixing text and graphics on a Hi-Res screen (PMODEs 3 or 4). Features include: modifiable character set, true lowercase, control of size of the scrolling window. Included with G'NT is CHRGEN which allows change, delete and your own characters. Spectral Associates, 3418 South 90th St., Tacoma, WA 98409, cassette \$9.95

CoCo Screen Dump, a 16K screen dump program for the Epson and Gemini printers. Options include: standard or reverse images, regular or double-sized pictures and 600-900 Baud. This program is helpful for *Graphic* and *Bjork Block* users. Spectrum Projects, P.O. Box 21272, Woodhaven, NY 11421, cassette or disk \$19.95 plus \$3 S/H

The Animator, a 32K ECB animation program that features professional motion picture animation techniques, 12 "help" screens

and a comprehensive manual. Thirty-two "cells" or character positions are cycled and recycled to create the illusion of motion and sound effects are possible. Triad Pictures Corp., P.O. Box 1299, 134 Simders Rd., Sequim, WA 98382, three cassettes \$35, plus \$2 S/H

Alphabet Stew, a 32K ECB education program for preschoolers which rewards recognition of letters of the alphabet and correct usage of the keyboard with pictures, shapes, colors and melodies. Triad Pictures, P.O. Box 1299, 134 Simders Rd., Sequim, WA 98382, cassette \$18 plus \$2 S/H

Centipede ABC's and Centipede 123's, two 16K ECB programs designed to guide preschoolers through letter and number recognition. Both programs feature Hi-Res graphics. Triad Pictures, P.O. Box 1299, 134 Simders Rd., Sequim, WA 98382, cassette \$16 each, both \$25 plus \$2 S/H

Jungle Queen, a 32K arcade game featuring four Hi-Res screens complete with objectives, perils and tips for combating the dangers. Zoso Software, 6606 Skyway Dr., Columbus, OH 43229, cassette \$26.95

The *Seal of Certification* program is open to all manufacturers of products for the TRS-80 Color Computer, the TDP-100, or the Dragon-32, regardless of whether they advertise in THE RAINBOW.

By awarding a *Seal*, the magazine certifies the program *does exist*, but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW's reviewers for evaluation.

— Monica Dorth

CALL FOR CURRENT PRICES

— CHRISTMAS IS COMING —

DRIVE 0 or
2 DRIVES

\$269.

WITH RS DOS
& 40 TRACK
DRIVES

ADD \$10. FOR JDOS
& MANUAL or
\$10. FOR RS MANUAL
40 TRACK DRIVES NOW ARE
NEW 1/2 HEIGHT DIRECT DRIVES

Complete disk drives from...

INCLUDING CASE & POWER SUPPLY
\$159.40 Track \$159. Double Sided \$209.

PANASONIC 1/2 HEIGHTS ADD \$10. FOR TEAC DS
\$229. with Owl Doubler 2 DRIVE \$389.-\$405. with Owl Doubler

NOW DOUBLE YOUR OWLS!!! \$39.95

OWL DOUBLER is a device that allows use of both sides of double sided drive ! Software independent sits inside case and makes one disk drive 0&1 and the other 2&3!



All drives NEW.
40 track single
sided drives may
be manufacturers
overstock.
6 month warranty
on all drives.



M.C. & VISA Accepted

OWL-WARE
P.O. Box 116-E
Meritztown, PA.
19539

PA Res Include 6% Tax
(215) 682-6855



ENDICOTT

COMPUTER SOFTWARE AND ACCESSORIES



PRINTERS

(SEE PRINTER INTERFACE BELOW)

SPIRIT (SAME AS MX80)\$289.00
OKIDATA 92P (160 CPS).....\$435.00
CORRESPONDENCE QUALITY*

★ NEW! ★ NEW! ★

ABATI LO-20P (PARALLEL).....\$389.00
18 CPS-DAISY WHEEL-LETTER QUALITY
TRACTOR FEED.....\$ 79.00

MONITORS

(SEE MONITOR INTERFACE BELOW)
ALL WITH NONGLARE SCREEN.

NEW PRICE BYAMDEK (2 YEAR WARRANTY)

COLOR 1+\$284.00
VIDEO 300(G)\$149.00
VIDEO 300(A)\$159.00
GORILLA (GREEN)\$ 99.00
GORILLA (AMBER)\$109.00

ENDICOTT JOYSTICK

\$19.95 EACH \$37.95 FOR TWO
ANALOG TYPE - PLUGS RIGHT IN!

"In use, we found the ENDICOTT JOYSTICK to be smooth and responsive. ...built to last, the Endicott model is a solid buy". the RAINBOW, October 1982

"...provided the best feel of all the joysticks tested. ...[a] rugged unit at an affordable price". 80 micro, March 1983

NEWPRICES**

PRINTER INTERFACE

p/b SERIAL/PARALLEL

SWITCHABLE: 300 TO 9600 BAUD
PRINTER AND MODEM CONNECTIONS.
NOTHING ELSE REQUIRED.

~~\$89.95~~ \$59.95

PURCHASED WITH PRINTER \$54.00

MONITOR INTERFACE

VIDEO PLUS\$24.95
(COLOR OR MONOCHROME)
PURCHASED WITH MONITOR \$20.95

VIDEO PLUS IIM\$26.95
(MONOCHROME FOR COLOR II)
PURCHASED WITH MONITOR \$22.95

VIDEO PLUS IIC\$39.95
(COLOR FOR COLOR II)
PURCHASED WITH MONITOR \$33.95

NEW BLANK MEDIA **PRICES**

ELEPHANT SSDD\$19.00
ELEPHANT SSDD\$21.00
ELEPHANT DSDD\$28.00
BASF QUALIMETRIC SSDD\$23.00
BASF QUALIMETRIC DSDD\$28.00
C-10 CASSETTES (ONE DOZ)\$ 7.50

WICO

ATARI JOYSTICK ADAPTER
\$17.95

MEDIA STORAGE TAPE

TAPE CAROUSEL (HOLDS 25) ...\$13.00

DISKETTE

FLIPN'FILE 10\$ 5.45
FLIPN'FILE 50\$29.95
FLIPN'FILE 50\$29.95
DISK BANK 5 (HOLDS 50) ...\$13.95

SUPER-PRO KEYBOARD

BY: MARK DATA

NEW

PRICES

ADAPTER REQUIRED ON
COMPUTER BOUGHT AFTER 10/82

KEYBOARD~~\$64.95~~ \$56.95 ADPT \$3.95

VOLKSMODEM

BY: ANCHOR AUTOMATION
300 BAUD, DIRECT CONNECT
MANUAL ANSWER, MANUAL DIAL

INCLUDES CABLE \$69.95

WICO JOYSTICK

BIG BAT HANDLE
SPRING RETURN OR FREE FLOAT
ANALOG TYPE - PLUGS RIGHT IN!

\$38.95 EACH

Look at These Discounts and Compare...Remember WE PAY SHIPPING!

SOFTWARE PRICES SHOWN ARE **20% OFF** LIST PRICE!

SPECTRAL ASSOCIATES

	T	D
▷ GALAGON	\$19.95	\$23.15
▷ PENGON	\$19.95	\$23.15
▷ COLOR PANIC	\$19.95	\$23.15
▷ CUBIX	\$19.95	\$23.15
▷ LANCER	\$19.95	\$23.15
▷ MS GOBBLER	\$19.95	\$23.15
▷ WHIRLYBIRD RUN	\$19.95	\$23.15
▷ LUNAR ROVER PATROL	\$19.95	\$23.15

COMPUTERWARE

	T	D
▷ MR DIG	\$22.35	\$24.75
▷ JUNIOR'S REVENGE	\$23.15	\$25.55
▷ RANDOM BASIC (OS-9)		\$50.00
▷ COLOR BASIC COMPILER		\$31.95
▷ 64K SCREEN EXPANDER (64K)	\$19.95	\$22.35
* THE SOURCERER (R DOS)	\$27.95	\$31.95
▷ THE SOURCERER (OS-9)		\$31.95
▷ MACRO ASSEMBLER & XREF (R DOS)		\$39.95
▷ MACRO ASSEMBLER & XREF (OS-9)		\$39.95
▷ COLOR EDITOR	\$19.95	\$23.95
▷ COLOR MONITOR	\$19.95	\$22.35
▷ MOON HOPPER	\$19.95	\$22.35
▷ BLOC HEAD (O-BERT)	\$21.55	\$23.95
▷ DOODLE BUG (LADY BUG)	\$19.95	\$22.35
▷ GRAN PRIZ	\$17.55	\$21.55

SOFT LAW

	T & D INCLUDED
▷ VIP WRITER (INC SPELLER)	\$47.95
▷ VIP SPELLER	\$31.95
▷ VIP CALC	\$47.95
▷ VIP TERMINAL	\$39.95
▷ VIP DATA BASE	\$47.95 (DISK)
▷ VIP DISK-ZAP	\$39.95 (DISK)
WRITER/ SPELLER-CALC	
DATA BASE	\$139.00
ENTIRE LIBRARY	\$210.00

ELITE SOFTWARE

	T	D
▷ ELITE-WORD	\$47.95	\$47.95
▷ ELITE-WORD/SPEL		\$59.95
▷ ELITE-SPEL		\$23.95
▷ ELITE-CALC	\$47.95	\$47.95
▷ ELITE-TEST		\$59.60
▷ ENTIRE LIBRARY (DISK)		\$157.00

PROGRAMMERS INSTITUTE

	T	D
▷ COMPLETE PERSONAL ACCOUNTANT - (1,2,3)	\$59.95	\$63.95

SPECIAL SALE!
30% OFF

PRICKLY-PEAR SOFTWARE

	T	D
▷ MUSIC READER	\$24.45	\$27.95
* ERLAND	\$17.45	\$20.95
▷ TRAVELIN TOAD	\$17.45	\$20.95
▷ OCKYWOXY	\$17.45	\$20.95
▷ ADVENTURE IN WONDERLAND	\$17.45	\$20.95
▷ THE DISK MANAGER		\$20.95
▷ THE DISK MASTER		\$17.45
▷ COLORKIT (Programming Utility)	\$24.45	\$27.95
▷ FLIGHT	\$13.95	\$17.45

COGNITEC

	T	D
▷ TELEWRITER 64	\$39.95	\$47.95

TOM MIX

	T	D
▷ QUIX	\$19.95	\$22.35
▷ elec'TRON	\$19.95	\$22.35
▷ WORLDS OF FLIGHT	\$23.95	\$26.35
▷ SKRAMBLE	\$19.95	\$22.35
▷ SR-71	\$23.15	\$25.55
▷ CU'BER	\$22.35	\$24.75
▷ BUZZARD BAIT	\$22.35	\$24.75
▷ AIR TRAFFIC CONTROLLER	\$23.15	\$25.55
▷ SPACE SHUTTLE	\$23.15	\$25.55
▷ THE KING	\$21.55	\$23.95
▷ COLOR GOLF	\$14.35	---
▷ TAPE TO DISK	\$14.35	---
▷ DISK TO TAPE	\$14.35	---
▷ SCREEN PRINT ROUTINE	\$15.95	\$17.55

(Specify Printer)

ADVENTURE INTERNATIONAL

	T	D
* FIRE COPTER	\$19.95	---
* SAIGON: THE FINAL DAYS	\$19.95	---
* EARTHQUAKE	\$19.95	---
* AIRLINE	\$19.95	---
▷ SEA DRAGON	\$27.95	---
▷ TRIAD	\$27.95	---
▷ DISKEY [Utility To Examine And Repair Disks, Plus Computer Diagnostics]		\$39.95

B5 SOFTWARE

	T	D
MONEY	\$15.95	---
BORROW	\$15.95	---
CARRY	\$15.95	---
MATH FACT	\$13.55	---
ABCS	\$ 7.95	---
ALL	\$64.00	---

NOTE: ALL SALES FINAL. NO RETURNS UNLESS DEFECTIVE. ADDITIONAL LISTINGS IN OUR FREE CATALOG - CALL OR WRITE.

*Requires 16K Ext. Basic Minimum ▷Requires 32K Ext. Basic Minimum. □We Recommend 32K or 64K. Others 16K Ext. Std. Basic Minimum

WE PAY SHIPPING TO U.S.A., CANADA, AND MEXICO
C.O.D. ADD \$2.00 (U.S.A. ONLY). ALLOW 2 WEEKS FOR
CHECKS TO CLEAR. NO P.O. BOXES MUST HAVE STREET
ADDRESS. SHIPPING - OTHER COUNTRIES: ADD \$2.00
EACH SOFTWARE ITEM AND EACH JOYSTICK. ADD
\$5.00 EACH ALL OTHER ITEMS (NO MONITORS OR
PRINTERS SHIPPED OUTSIDE U.S.A.). ITEMS ARE
SHIPPED AIR MAIL. PRICES SUBJECT TO CHANGE
WITHOUT NOTICE.

ENDICOTT
Computer Software And Accessories
2806-A S. MEMORIAL PARKWAY
HUNTSVILLE, ALABAMA 35801
VISIT OUR STORE
PRICES IN AD ARE MAIL ORDER ONLY.

PHONE ORDERS

205/536-4400

(PHONE OPEN 7 DAYS A WEEK)



WE PAY SHIPPING!



REVIEWING REVIEWS

SHAFT

Editor:

Your review of *SHAFT* (July 1984, Page 23), did the game no justice. Mr. Schechter obviously did not give the game a fair trial before writing his review.

To begin with, Mr. Schechter stated that the graphics were not as good as many other current games. Why should they be? I received my copy of *SHAFT* in June 1983. This hardly allows for the game to be compared with today's graphics. Your reviewer obviously did not play the game very long. I have never come across a situation in which escape was impossible as Mr. Schechter stated happened to him. Also the patterns are not random, as there are about 12 different patterns which the elevators follow.

T. Sherfy
Fayetteville, NC

WHIRLYBIRD RUN

Editor:

I would like to comment about Mr. Joe O'Connor's review on *Whirlybird Run* [September 1984, Page 220]. I might only be 14 years old, but I'm a big fan of video games.

First of all, there are explosions in the game. They're just hard to hear. Although there are exploding sounds, Mr. O'Connor, I think you're right about the rest. Saucers and rockets could have sound to make it a better game, but with the limitations of 16K, it's still pretty good.

Lastly, there is a pause feature! Push Shift and BREAK together to pause and Shift and '@' to continue.

I think this should make *Whirlybird Run* a little bit better game.

James Foster
Modesto, CA

DISKEY

Editor:

I read the *DISKEY* review by Bruce Sterling in the February issue of *RAINBOW*, Page

251. Your reviewer failed to tell the readers that this program will only work on Disk BASIC 1.0. I have Disk Extended BASIC 1.1. When typing *DIR*, you get "master BAS 0 B 4," as the book says. When you type *RUN* "MASTER," you get an error in Line 20, and that's it.

I contacted Adventure International. They said it was a defective disk and to return it. They sent me another disk which does the same thing. A week after receiving the second disk, I received a letter from Adventure International saying that this is the only version of *DISKEY* and if it doesn't work, to return it to the place of purchase. That's fine, but the store has since gone out of business, so now I'm stuck with a program which can't be used.

In closing, I would like to make a suggestion to your reviewers: list the minimum system requirements and which ROMs are required to make any of the programs that are reviewed work.

R.W. Celland
Surrey, British Columbia

LEARNING GAMES FOR CHILDREN

Editor:

In regard to the review of my programs *Learning Games For Children* by Marty Sheldon [the review appears in this issue of *THE RAINBOW*], her first criticism is that the age range three to eight is appropriate, but not for all three games. Certainly, all children are not at the same learning level even at the same age. If my programs provide something of interest to all members of this age group and present a future challenge to strive for, then where is the problem here? I specifically state in my documentation that the parent should help his children initially going through these educational programs. The child will eventually learn the harder points and arouse his curiosity to explore further. These programs certainly are not meant as an end in themselves. This is just the beginning!

Another criticism is that it is difficult for

the child to spell a word blindly after having picked the word out of a list of three. I state in the documentation that this can be difficult and I, therefore, do not penalize the child for misspellings in his score tally. I don't consider this feature of spelling a word blindly to be a disadvantage. It is another goal to be mastered and can be with some initial adult supervision.

Ms. Sheldon claims that my square is rectangular and that my circle is a "fat ellipse." I can assure you that my square was a square and that a circle was a circle on the TV set I use with the computer. However, on two other sets the shapes were indeed as Ms. Sheldon reported. None of my associates who has reviewed the programs reported any problem like this, but a small poll during the last week has revealed that the shapes are distorted on different TV sets. In fact, on some TVs the square and circle are shorter in the vertical dimension which is exactly the opposite of the reviewer's problem. It seems that the Color Computer does a valiant attempt at keeping this distortion to a minimum.

A graphics scene in *PMODE 4* or *PMODE 1* (which I use) uses a display format of 256 horizontal by 192 vertical (*PMODE 4*) or 128 horizontal by 96 vertical (*PMODE 1*). In both cases, you have a height to width ratio of 4/3. If the Color Computer were to output a graphics scene to an absolutely square monitor screen, then the vertical elements would be 4/3 longer than the horizontal elements. A square would be a rectangle! However, your TV set has a nominal aspect ratio of 4/3. The TV will typically stretch the horizontal elements by a factor of 4/3 of the vertical elements.

Let's see now, if the Color Computer puts a horizontal element that is 3/4 of the vertical and the TV multiplies the horizontal elements by 4/3 then we should get a square element! We will if the TV set has perfect vertical, horizontal width and linearity adjustments. The problem is that few TV sets do, including Ms. Sheldon's. The remedy, in this case, is to ignore the problem, as it is quite minor, or to adjust the TV set. (I haven't had too many complaints from four-

year-olds about the circles being five percent elliptical in nature.) I don't recommend Ms. Sheldon's approach which is not to buy this program since it "teaches incorrect shapes." I have included in the documentation a section which advises the parent/teacher to adjust the TV's color controls and the vertical height/linearity and horizontal width control if necessary.

Moving on to the criticism of error messages appearing and loss of voice synchronization, I just wish that your reviewer would state my company policy regarding bad tapes instead of glibly giving us credit for not losing voice sync more often due to the number of times the recorder is turned on and off. I have gone to considerable lengths to design a system to overcome these problems. I have recorded synchronizing data at least every 20 seconds interspersed with the verbal audio. The program searches for this data and could result in loss of voice sync if the tape were defective. It is possible to lose voice sync if the child stops the tape or advances it and I cannot protect against this if this is the reviewer's problem.

Revision E and earlier versions of the Color Computer have a problem with sticking cassette motor relays. My CoCo sometimes does this and I guarantee you that you will lose voice sync if this is the problem.

I cannot explain the error messages displayed on the screen unless it is a defective tape. I do clearly state that there is a copy on both sides of the tape if there are any problems like the reviewer experienced. I also state that there is a free replacement policy for the first 30 days. The reviewer did not contact me before she decided to report this as an inherent "problem" with the *WORD-TEST* program.

I do not get a positive feeling from reading Ms. Sheldon's review and I consider these to be very positive programs. In the review, I see no mention of how the child interacts with the program other than "the child liked the incorrect buzz response." The children that I have observed became very involved with the songs, faces and the verbal instructions. They had fun! My own three-year-old became interested in learning how to read after becoming involved in these programs which I find to be the real benefit to this type of game.

Ms. Sheldon also does not mention the fact that the child is rewarded with a graphics score and verbal attaboys which varies depending on how well he does. The rewards are always positive no matter how poorly the child does. The reward scenes and songs are randomly selected on each run of the program thus insuring that the child will be less likely to lose interest in the lesson. No mention is made of the fact that the positions of the shapes, words and number of marbles to be counted are randomized on each run so that the child can't simply memorize positions. The *BREAK* key is also disabled which is another positive feature.

In summary, the reviewer dwelt on minor questionable problems and many non-problems. The reviewer may have had a defective

tape (my problem) but what is more disconcerting is that the reviewer did not take into account the sloppy nature of TVs and blamed the problem on the programs. The reviewer did not point out the many positive features of these programs and the enthusiasm that children exhibit when playing them, as I have observed. Only children can evaluate these programs completely and I have tried very hard to consider the child at all times.

Donald Davis
DD Software

Editor:

The criticisms of DD Software regarding my failure to account for the sloppy nature of television reproduction are invalid. It is the programmer's responsibility to design within the medium, capitalizing on its strengths and overcoming its weaknesses. The consumer will, after all, use the program on his own TV. And if the purchaser needs to be a TV repairman to reproduce the intended results of the software, he should know that before purchasing the program, not after.

Martha Sheldon
Aurora, NY

LOUD AND CLEAR

Editor:

In the October issue of *THE RAINBOW*, Mr. Ed Ellers extensively tested and reviewed the new Mark Data Products Universal Video Driver. Although, Mr. Ellers stated it was a well-designed and well-made product, there were a couple of statements in the review we would like to clarify.

Mr. Ellers correctly states that our installation instructions tell users of 'D' and 'E' boards to leave the CPU shield cover off. He strongly recommends that you carefully replace the shield after installation to minimize RFI. We do not disagree with Mr. Ellers' statement, but wish to point out that some competitive video adapters give you no choice — the shield cover *must* be left off. With our video driver, the shield cover *can* be reinstalled, if the installation is done carefully.

Mr. Ellers also reported that the Universal Video Driver audio circuit loads down the CoCo's sound generator. We found that the problem was limited to 'F' board models and was caused by an error in our installation instructions. This error has been corrected. We must point out, however, that *some* monitors with low impedance audio circuits could load down the sound signal from *all* CoCo models. The instructions supplied with the Universal Video Driver offer suggestions to help users overcome these inadequacies and also suggest how to provide audio for video monitors that do not offer this capability.

We appreciate the time and effort Mr. Ellers devoted to prepare his thorough review and the opportunity to add these comments.

Ron Krebs
Mark Data Products

NEXT WEEK I GET O-PAK!

Computers are not too expensive,
A mere few hundred or so.
Add a ROM pack of *Pacman* or *Zaxxon*.
It won't set me back too much dough.

Soon my programs get longer and longer.
A printout is what I require.
Epsons are only six hundred.
Teletwriter fulfills my desire.

Tapes are such great aggravation.
I search desperately forward and back.
If I'm lucky, I find my lost program.
If not, what I get is a crash.

Disk drives become so appealing.
My friends load their files in a flash.
They don't get endless I/O errors.
All it requires is more cash.

Once a *RAINBOW* was something to look at,
As it shimmered and glowed in the sky.
Once *Hot CoCo* was something that warmed you.
Magazines galore I now buy.

Computer books are piled high in corners.
Chromasette — I have every tape.
I spend all my time filling coupons.
I can't resist any bait.

Software has become an addiction.
Now the money seems really to fly.
FLEX, *OS-9* and then *COBOL*.
I look for new programs to buy.

What began as a cheap home computer,
Has mushroomed beyond all belief.
It devours much cash, endless hours.
Soon, I'll be out on relief.

My erstwhile soulmate has left me.
My employer gave me the sack.
All I've got left is my CoCo.
But, next week I get O-Pak!

— Valerie Rhead

Concordance — An Aid To Programming Development

Are you a frustrated programmer? Do you have trouble debugging someone else's program or worse yet, your own? Did you finally convince the "real" head of the household that you needed a printer only to go crazy trying to read an *LLISTed* program? Have you ever made a brilliant modification to a magazine program only to discover that the variable you used was already used somewhere else? Well, cheer up Bunky, Mr. Bill Wasson of Echo Soft has released a new utility that should make your life considerably easier.

The program requires a minimum of 32K and Extended BASIC and is entitled *Concordance*. Say what? Yes, I confess, I had to consult Webster's on this one myself. Definition: "an alphabetical index of the principal words in a book." BASIC translation: "A nicely formatted listing, a cross-reference of all referenced line numbers and an alphabetical listing of all variables and the line numbers in which they appear." Interested? Read on and I will go into a more detailed explanation.

The actual program that does all the work is written in machine language. This program is preceded by a BASIC front end program that allows you to select from many options and actually customizes the machine language code for your individual needs. Upon loading, *Concordance* asks you if you wish to make a backup copy, which it does

automatically. For a utility, especially a modifiable one, this is a real benefit and shows a great deal of professionalism on the author's part. Before I forget, included with the program is a well-written, seven-page instruction booklet which covers in detail all the various options as well as how to get the most benefit from the results of this program.

Among the many options included, are the loading of *Concordance* into the upper 32K of a 64K machine, setting the printer Baud rate, selecting the type of format, i.e., 'pretty print' or 'standard' and setting the printer margins which include top, bottom and left side as well as number of lines per page and number of characters per line. Of the two types of format the standard is most similar to *LLIST* except that the line numbers are offset to make the listing more readable. The only drawback to this is, if you wish to duplicate listings in a magazine such as *RAINBOW* by setting the printer width to 32, you still will not get an exact match because of the offset line numbers. The other, and more impressive, format is the 'pretty print.' 'Pretty print' places one statement per line, indents both *IF... THEN* and *FOR... NEXT* statements and adds spaces wherever necessary to make everything more readable. Also included in both formats are automatic page numbering and the ability to enter a heading to be printed at the top of each page (I use program name and date). All in all, once you use the 'pretty print' listing, going back to the normal *LLIST* is like a return to the stone age.

Although the 'pretty print' option is impressive it's only the tip of the iceberg. Next comes the line number cross reference listing. This is a list of all line numbers referenced by *GOTO* or *GOSUB* as well as all *PEEKs* and *POKEs* and their addresses. This makes unraveling "spaghetti" code much less of a nightmare, and the ability to easily isolate all *PEEKs* and *POKEs* makes debugging a pleasure. (Well, almost!)

Finally, *Concordance* produces a variable cross reference listing showing in alphabetical sequence all variables and the line numbers in which they are used. It even highlights any variables used in *PEEK* or *POKE* statements. In addition to all of this, *Concordance* does this very quickly. If you have ever used a BASIC 'pretty print' or cross reference program, you'll really appreciate *Concordance*. The only reason this program runs longer than a straight *LLIST* seems to be that it uses more paper. When the program listing finishes the cross reference listing it prints it immediately, there's no hesitation.

The next best thing to having a printer is this program. Enclosed with each program is a personal note from Mr. Wasson providing you with his home phone number should you have any trouble or questions.

(Echo Soft, 17 Skyline Dr., Chalfont, PA 18914, cassette \$21.95, disk \$24.95)

— Ken Boyle

Aurora Computing

49 Brookland Ave., Aurora, Ontario Canada L4G 2H6

FAMILY GAMES

The popular **STOCKBROKER** and **CRIBBAGE 32K** \$14.95 each.

ADVENTURE GAMES: Sea Quest and Shenanigans from MARK DATA only \$24.95(C); \$27.95(D) each

From BRANTEX, **PIRATE TREASURE 16K** \$13.95

SCAVENGER HUNT 16K \$18.95

EDUCATIONAL GAMES

COLORMINO, CONCEN - improve your memory and logical thinking - 16K \$10.95 each

Also from BRANTEX

EOU-COMBO (Math Derby, Peek 'N' Spell Metric Converter) 16K only \$29.95

BUSINESS: HOUSEHOLD EXPENSE MANAGER 16K \$19.95

LOAN ANALYSIS 16K \$20.95

NEW from MARK DATA

The amazing **TIME FIGHTER 16K** \$24.95(C)
32K \$27.95(D)

Also the ever popular **GLAXXONS 16K** \$24.95(C)
32K \$27.95(D)

UTILITIES: ROMOISK: Run your rom pack games from a disk! 64K \$15.95

MR. COPY - make up to 99 copies of one program at once! 16K \$15.95

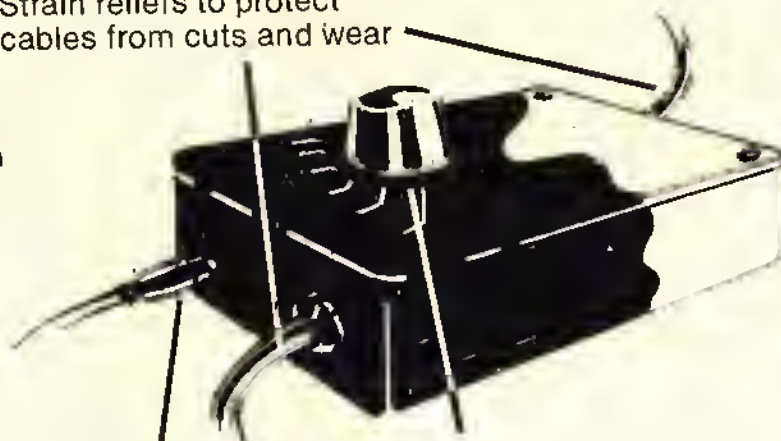


Metric Industries



Quality accessories for your
COCO, COCO2 and TDP100

Strain reliefs to protect
cables from cuts and wear



Gold plated contacts on
"Centronics" type
connector



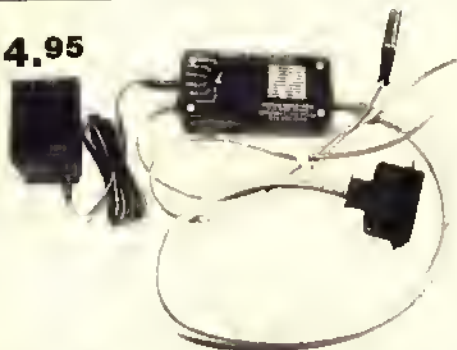
Small size 4" x 2" x 1"
Military type "G10"
Double sided circuit board
State of the art high speed
digital "CMOS" circuitry

Jack for power supply

Silver plated switch contacts

Model 101 Interface \$54.95

- Serial to Parallel Interface
- Works with any Centronics Compatible Printer Including Radio Shack, TDP, Gemini, Epson, Gorilla and many others
- Six switch selectable baud rates (300 to 9600)
- 90 day warranty
- Power Supply included



- Uses special features of your printer for standard, expanded and condensed characters
- 24 tree labels included with program
- Auto centering features for each line of text
- 16K ECB required

Model 102 RS-232-C Switcher

\$35.95

- Switches all three data lines
- Indicator lights let you know computer is on
- 3 position switch has silver plated contacts for high reliability
- Color coded lights indicate switch position
- Color coded labels for your printer, modem etc., supplied



General Items

- Gemini 10X Printer **\$319.00**
- Special Save — Printer & Interface **\$360.00**
- C-10 Cassettes **\$7.50/dozen**
- Hard plastic boxes **\$2.50/dozen**
- Pin-feed Cassette labels **\$3.00 per 100**
- Free shipping on all orders over \$50.00
- Add \$3.00 for shipping on orders under \$50.00
- Ohio residents add 5.5% sales tax
- Phone order line for VISA and MASTERCARD, orders accepted 24 hrs. a day, call **513-677-0796** or send check or money order to:

Cassette Label Program \$6.95

- Prints five lines of information on pin-feed cassette labels
- Menu driven — easy to use



Metric Industries
Department R
P.O. Box 42396
Cincinnati, OH 45242

Dealer Inquiries Invited

GREAT COCO PRODUCTS



SUPER SCREEN

The Color Computer Supercharger

- A big 52 character by 24 line screen
- "PRINT @" is fully implemented on the big screen
- Easily combine text with Hi-res graphics
- Auto-key repeat for greater keyboard convenience
- The "ON ERROR GOTO" statement is fully implemented
- Control codes for additional function

Super Screen comes with complete, well detailed instructions and is available on cassette or disc. It adjusts automatically to any 16K or greater, Extended or Disc Basic Color Computer or TDP-100 and uses only 2K of memory in addition to the screen memory reserved during power up. Guaranteed to be the most frequently used program in your software library...once you use it, you won't be without it!

Hot CoCo, Jan. '84 "Super Screen represents a quality utility program that fills a definite error-trapping utility of Super Screen."

Color Computer Magazine, May '84 "Super Screen is a worthy addition to anyone's software library. It has become my most used utility and has made programming in BASIC on the Color Computer a joy."

Cassette \$29.95

Disc \$32.95

ORDER ENTRY SYSTEM

Rainbow, Feb. '84 "If you are looking for a program to keep track of your sales and print invoices, then this one will take care of those needs quite well...A good program that would serve the invoicing needs of a small company quite nicely."

The Mark Data Products sales order processing system provides a fast, efficient means to enter orders, print shipping papers and invoices, prepare sales reports, and monitor receivables. The system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives.

The MDP Order Entry System is a family of programs which operate interactively by means of a "menu" selection scheme. Up to 900 products may be defined and a single disc system can hold over 600 transactions. When the operator selects a task to be performed, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary paperwork including shipping and invoice forms, daily sales

This order entry software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY \$99.95**

SUPER PRO KEYBOARD



ONLY \$64.95*

- Original key layout
- Fast, easy installation—no soldering
- Individually boxed with full instructions
- Smooth "Touch Typist" feel—no sagging
- U.S. made—high quality, quad gold contacts
- Professional, low profile, finished appearance

* Computers produced after approximately October 1982 require an additional keyboard plug adapter. Please add \$4.95.

EASY-FILE

Data Management System

NEW!

- Need a good mailing list or customer list program? How about a program to keep track of your investments, your computer magazines, or record collection? Do you have an inventory of all household items for insurance purposes? **EASY-FILE** will do all of these things and many more.
- **EASY-FILE** makes data managing a breeze with single key menu selections, extensive error handling procedures, a demonstration data file and a detailed, easy to understand instruction manual.
- **EASY-FILE** is powerful too. It automatically enhances your monitor screen to a full upper and lower case 51 character by 24 line display. **EASY-FILE** allows up to 30 data fields and provides password file protection, selectable numeric totalling, and complete data searching and editing capabilities. You can quickly enter, locate, review and modify data records, and even transfer records from one file to another.
- Sorting? You bet! **EASY-FILE** allows you to sort up to 5 levels of data and allows you to define upper and lower limits as well. You can sort in many different ways and save the results in individual index files. These index files may be used later to determine what will appear on your printed reports.
- Reports are easily prepared with **EASY-FILE** because it offers so many automatic features. There is no need to generate complex report forms. With **EASY-FILE** you simply select from a list of options to determine what your report and header will look like. There are countless variations. **EASY-FILE** takes care of tab stops and field spacing automatically. Prepare horizontal reports (80 or 132 columns), vertical reports or labels! Save your favorite report formats right in a data file so they may be used whenever you need them.

- The **EASY-FILE** master disc and instructions are packaged in an attractive 3-ring binder. Requires 32K and at least one disc drive.

Order yours now! Get organized for only **\$59.95!**

NEW!

UNIVERSAL VIDEO DRIVER

Carefully engineered to work with ALL Color Computer models, including the new COCO II

ENABLES YOUR COCO TO OPERATE WITH A VIDEO MONITOR INSTEAD OF A TELEVISION

- Works with Monochrome Monitors! • Audio Connection Included!
- Great Price! **ONLY \$29.95**

ACCOUNTING SYSTEM

Rainbow, May '84 "Considering what it can do to organize a small business, it is quite a value."

Hot CoCo, June '84 "...a serious, professional accounting program and well worth its price. The programs are complete and simple to use."

The Mark Data Products Accounting System is ideal for the small businessman needing a fast, efficient means to process income and expenses, prepare detailed reports and maintain most of the information required at tax time. The system is a family of programs which operate by means of a "menu" selection scheme. When the operator selects a task to perform, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary accounting reports including a transaction journal, a P & L or Income report, an interim or final balance and a balance sheet.

Up to 255 separate accounts may be defined and a single disc system can hold over 1,400 transactions. The system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives.

This accounting software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY \$99.95**

FREE - Send for our NEW 24 page catalog!

Mark Data Products

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

SHIPPING: All orders under \$100 please add \$2 regular, \$5 air. All orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount, please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software.

\$\$ SAVE MONEY ON YOUR \$\$ CASSETTE & DISC SUPPLIES

CASSETTES

We buy cassettes and discs in large quantities for our own use and can pass the savings on to you.

C-10 Cassettes w/labels	.59 ea	10 for \$5.50
Cassette storage box	.25 ea	10 for 2.00

5 1/4 DISCS

High quality nationally advertised brand. Guaranteed Performance! We will replace any disc that fails during normal use. Discs are single sided, double density, reinforced hub with Tyvek sleeve. \$2.25 each 10 for \$19.95

ROMS

Basic 1.2	\$39.95
Extended 1.1 w/manual	49.95
Disc 1.1	39.95

NEED MORE MEMORY?

64K Memory Expansion Kit

All parts and complete instructions (For 'E' and 'F' boards and CoCo II)
\$59.95

COCO DISC DRIVES

COMPLETE SYSTEMS INCLUDE:

- Hi-Quality Teac Thin Line Drives
- Attractive, Beige Dual Drive Cabinet/Power Supply
- Full Panel for Single Drive Disc Systems
- Radio Shack or I & M Controller
- Cable and Operating Manual
- Full 90 Day Warranty



Single Drive (SSDD) in Dual Cabinet w/Controller	349.95
Additional Drive	114.95
Two Drives (SSDD) in Dual Cabinet w/Controller	459.95
Single Drive (DSDD) in Dual Cabinet w/Controller	439.95
Additional Drive	199.95
Two Drives (DSDD) in Dual Cabinet w/Controller	629.95
Dual Cabinet/Power Supply	79.95
Disc Controller (Radio Shack or I & M)	139.95
Connecting Cable	24.95
Radio Shack DOS ROM 1.1	39.95

VIP SOFTWARE

We carry the most asked for software products for your convenience.

VIP Wilec	\$69.95
VIP Terminal	49.95
VIP Calc	69.95

NEW! SUPER BUG



Mark Data Products **SUPER BUG** is a powerful, relocatable machine code monitor program for your CoCo. If you are a beginner, the program and documentation are an indispensable training aid, helping you to gain a better understanding of your Color Computer and machine code programming. If you are an accomplished computerist, **SUPER BUG**'s capabilities, versatility and convenience will prove invaluable during programming and debugging.

SUPER BUG offers so many outstanding features that we are unable to list them all in this limited space, but here are a few: hex and alphanumeric memory display, modify, search, and test; full printer support with baud rate and line feed select; up to 220 breakpoints; mini object code disassembler; 64K mode setup; decimal, hex and ascii code conversion routines and extensive documentation.

Tape \$29.95

Disc \$32.95

INFORMATIVE BOOKS

"Your Color Computer" by Doug Mosher

Over 300 pages of detailed information...an indispensable introduction to your Color Computer, complete with diagrams, photographs, and a BASIC thesaurus and command reference section. A CoCo encyclopedia. \$16.95

"Programming the 6809" by Rodney Zaks

One of the best machine language texts available — required reference material. This book explains how to program the 6809 in machine language, covering all aspects progressively and systematically. \$15.95

QUALITY VIDEO MONITORS



SAKATA COLOR SC-100 - \$289.95

The SC-100 is a streamlined 13" composite monitor which produces sharp, brilliant colors. The cabinet is made of durable styrene and is available in an attractive off-white color. Includes audio with speaker and earphone jack. We highly recommend this color monitor because of its excellent performance and beautiful styling.

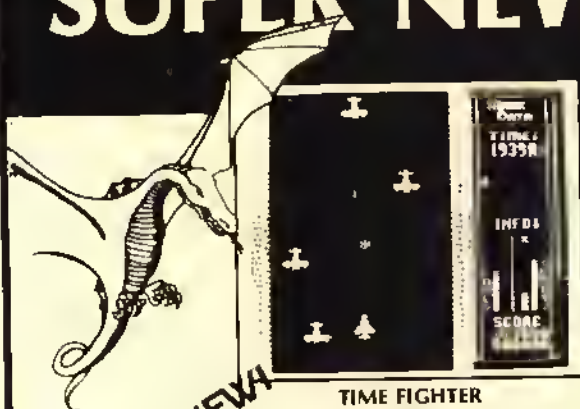


TAXAN AMBER SCREEN - \$139.95

A 12" amber screen composite monitor of the highest quality with exceptional reliability and performance 18 MHz bandwidth. Attractive off-white cabinet. We use this monitor in our offices.

SPECIAL: Order one of these quality monitors from MDP and get our Universal Video Driver for just \$24.95!

SUPER NEW GAMES!



NEW!

TIME FIGHTER

Pilot your MD-64 fighter through a hazardous time tunnel. Your mission is to destroy the dreaded Time Guardian who threatens the natural order of the universe. In order to reach this menace you must fight aerial dangers from strange and different time zones. If you like fast action, this one's for you! 16K required.

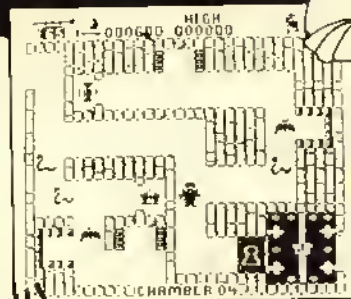
Rainbow, March '84 "One of the best in your library of computer games. It's a real gem."

CASSETTE

\$24.95

DISC

\$27.95



NEW!

TUT'S TOMB

Explore the ancient, mystical tomb of the great Pharaoh. Find the magical keys which lead you to unbelievable treasures as you out-manoeuvre the creatures that slither and swarm about you. Super fast arcade action—this one will knock your socks off with 16 screens of incredible color and sound! Fabulous! 32K required.

Hol CoCo, April '84 "State of the art CoCo graphics. A first rate game."

CASSETTE

\$24.95

DISC

\$27.95

Mark Data Products

SHIPPING: All orders under \$100 please add \$2 regular, \$5 air. All orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount; please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software.

Erland Is A Complex, Challenging Simulation Game

The year is 1250. In the gentle mists of a medieval old Ireland morning, Erin of Donegal, tenant landowner, stands on a hill overlooking his 500 acres. Gazing over his modest holdings, he wonders if the fish harvested by his one fishing boat will be enough to feed his peasants. The grain harvest was good but rats destroyed much, and prices are too high to buy as much as his people really need. More cats will help keep future grain losses down, but too many cats will result in even fewer fish for his people. Not being a warlike man, he shies away from the thought of having more armed guards, but only last week Jute invaders attacked the farm just south of him. He can't afford to lose the sheep, which did so well this past winter, let alone any of the peasants; but more men will mean more fish, more grain, more pay. He could borrow money, but bankruptcy would threaten. He has been hoping to start a trade fair (bazaar) but it looks like the extra grain and the need for armed guards will take all the surplus cash this year. His hoped-for abhey will have to wait even longer. The decisions he makes will affect the lives of his people as well as his own future.

To the south, Gale of Killakee strides out of her home. Her single-minded goal is to become powerful enough to be queen; every dollar wrung out of the misery of her peasants will go to armories and more guards. If she starves a few people by selling needed grain to start a new trade fair, what

does it matter as long as she has enough to man her fishing boats and farm her fields? All she has to do is make certain the peasants don't revolt. Almost rich enough to be a lady (second-level rank), she is already planning to invade Erin's lands as soon as she reaches the third rank.

Will lenient courts and low taxes allow Donegal to gain the population and people Erin needs to get ahead in life and protect himself against the scheming Gale? Will the cruel courts of Killakee provide enough war tax for Gale to attack? Can a good man survive and become king? Only hard work, good fortune and decades of time will tell.

The people who brought you the international spy thriller *Ockjwoky* have done it again. The first time my wife, our teen-age daughter and I played *Erland*, we were at the computer screen from 2 p.m. until 1 a.m. the next morning. Like Monopoly, a lot of time can be spent building one's domain—or losing it. This absorbing, challenging, frustrating game of land and resource management, with its high number of interdependent variables, has to be one of the most complex Simulations ever done. Trying to keep all the factors in your head (or on paper) can drive you up the wall: buying cats (apparently all neutered) to eat the rats to save the grain which feed the people to increase the population to man more boats and farm more land to raise the sheep to feed the guards who eat the sheep...whew! And that's only part of it!

Two to five people can play this hybrid of Extended BASIC and machine language, which is well-organized and plays smoothly. Graphics are quite good, and the sound from an unexpected disaster can scare the bejabbers out of you. The updated status of the current player is available often, and a summary comparison of players is displayed at the end of each "year." A game in progress can be saved after the last player has taken his/her turn. Tape and disk versions are incompatible.

A minor grammatical error exists. When one is purchasing grain, the program asks, "How many grain do you wish to buy?" Then again, maybe it's old Elizabethan Irish.

If you've never tried a Simulation game, and you want something easy to learn but not easy to win, this is the one to start with! If you are already a Simulation fan, you'll find this a challenge. In any event, you'll love it; you'll hate it; and I think you'll be glad you bought it—though your spouse may be less than enthusiastic if you disappear for hours without letting him/her play, too!

Now if I can figure out what happened to all those lambs I bought last spring.

(Prickly-Pear Software, 8532 E. 24th St., Tucson, AZ 85710, tape \$24.95, 32K ECB, disk \$29.95)

— Warren S. Napier



"DOUBLE-ENTRY" General Ledger Accounting System Reg. \$69.95 — ONLY \$19.95

"Double-Entry" General Ledger Accounting System for home or business: 16k, 32k, 64k. User-friendly, menu driven. Program features: balance sheet, income & expense statement (current & "YTD"), journal, ledger, 899 accounts & 2350 entries on 32k & 64k (710 accounts & entries on 16k) disk only. Version 1.2 with screen printouts. For upgrade return original disk & \$5.00.

"OMEGA FILE" Reg. \$69.95 — ONLY \$14.95

Filing date base. File any information with Omega File Records can have up to 16 fields with 255 characters per field (4080 characters/record). Sort, match & print any field. User friendly menu driven. Manual included (32k/64k disk only).

The One and Only "A M T" Reg. \$29.95 — ONLY \$14.95

AMT starts where everyone else ends. AMT calculates almost any sales or purchase outcome. Total interest, total principle, total payment are all figured. AMT is not just an amortization scheduling program, but a cost forecasting and prediction program. Useful to anyone who plans to sell or buy something with interest. [Disk Only]

BOB'S MAGIC GRAPHIC MACHINE

Turns 2 weeks of graphic programming into 2 hours with "rubber band" type graphics. Generate BASIC code to use in your programs. Easy drawing and manipulation of circles, ellipses, boxes, lines and ARCS. Single joystick operation with on line HELPS at all times. Allows text on the graphics screen and movement of objects on the screen. Can be used as a stand-alone graphics editor. Great for programmers and LOTS OF FUN for the novice. Reg. \$29.95 — ONLY \$14.95 for cassette and \$14.95 for disk, 64k with ECB required. [Includes instruction manual].

PERSONAL INFORMATION FILE—\$14.95 disk HOME INVENTORY—\$14.95 disk

CASH-IN (billing)—\$14.95 disk MEMO WRITER—\$14.95 disk

GRADE EASY (teacher data base)—\$14.95 32/64k disk

FLIP & FILE 50	\$19.95	VOLKS MODEM	\$59.95
FUJI-MAXELL-VERBATIM	\$17.95	RITEMAN PLUS PRINTERS	\$275.00
DATA DEFENDER 70w/lock	\$21.95	RITEMAN 15"	\$549.00
		GENERIC DISKS	\$14.95

COMPARE FEATURES AND PRICE, then buy "THE OTHER GUY'S SOFTWARE!"

(add \$2.50 for postage and handling)

Send check, money order or C.O.D., U.S. funds to:

THE OTHER GUY'S SOFTWARE • 875 S. Main • Logan, UT 84321

PHONE (801) 753-7620 or WRITE for a FREE CATALOG



CoCo Keeps Roll And Grade Books With *Teacher's Pet*

While part of all professions, paper work and record keeping seem to be particularly evident in the teaching profession. Most secondary teachers instruct over 120 students per day and have to maintain a file of attendance, quizzes, tests, and class averages for each pupil daily. The repetitive filing system is well suited for computer operation. *Teacher's Pet* has taken the school teacher's roll book and converted it to use on the computer.

The author, P.T. Jones, includes a four-page reference manual and an eight-page tutorial. Both are well written and concise.

As with any program that develops a filing system, the majority of the user friendly program is devoted to the construction of the file. Once that is completed, continued usage throughout the school year would be quite simple.

The main menu includes the following options:

CREATE, ALPHA ORDER, EDIT/ENTER, NEW STUDENTS, SEARCH, DELETE, YEAR END REPORT, PRINT CLASS LIST, INPUT/OUTPUT, MARKS, LDIR (PRINT DIRECTORY).

Each formatted menu-screen has subsections that are self-explanatory.

Teacher's Pet allows you to enter up to 40 students per class for each of four school terms. Each student can have a maximum of nine tests per term. The *CREATE* screen has you define the parameters of your file and controls the class code, the term you are in and how many tests you want to enter. The screen is formatted with each student's name and the number of tests entered for that term. The program permits editing of names only, names and marks, or marks only with suboptions for term or test. The author developed an interesting editing system that includes hitting the *BREAK* key to get back to the main menu. It is not difficult to get used to and does the usual things you would expect an

editing system to do, i.e., scanning or searching the file forwards or backwards. The program also will automatically alphabetize the class lists. Fail safe systems are incorporated to prevent loss of data.

The *YEAR END REPORT* allows any or all of the terms to be given a weighting factor so that if you want the second term to count twice as much as the other terms, enter the number two. The average of each student is calculated with the list of grades entered and can be sent to the screen or printer. The average is rounded off to the nearest whole percent. A zero entered as a test mark is not averaged with numerical grades. Letter grades will be printed as zeroes and are not averaged.

The program incorporates allowances for different Baud rates for printers and explains how to enter them. The author also includes hexadecimal numbers for the machine language program and several *POKEs* to change the screen color.

If you, as a teacher, have easy access to a computer and are not required to constantly refer to your roll book for student grades, then *Teacher's Pet* would suit you. I would have liked a couple of additional features, such as a flag for students whose average was below a defined standard and a specific progress card printout for those students. Overall, *Teacher's Pet* is a nicely developed filing program.

(Aurora Computing, 49 Brookland Ave., Aurora, Ontario, Canada L4G 2H6, 32K disk, \$34.95)

— Michael F. Garozzo

One-Liner Contest Winner . . .

Type and *RUN* this math program and the CoCo will ask for two numbers. Then it will add, subtract, multiply, or divide them for you.

The listing:

```
Ø CLS: INPUT "TYPE 2 #'S"; X, Y: PLAY
"L99ABBBABL5D": INPUT "PICK 1)+ 2)-
3)* 4)/"; E$: PRINT: IFE$="1" THEN P
RINT "ANS. ="; X+Y ELSE IFE$="2" THEN
PRINT "ANS. ="; X-Y ELSE IFE$="3" TH
ENPRINT "ANS. ="; X*Y ELSE IFE$="4" TH
ENPRINT "ANS. ="; X/Y
```

Michael J. Garozzo
Morrisville, PA

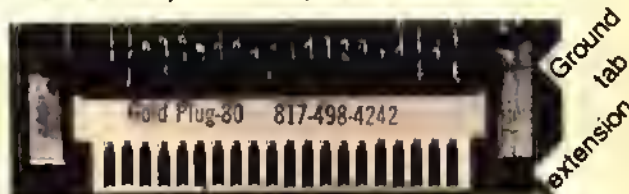
[For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.]

TRS-80+ MOD I, III, COCO, T199/4a
TIMEX 1000, OSBORNE, others

GOLD PLUG - 80

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors.

GOLD PLUG 80 solders to the board edge connector. Use your existing cables. (if gold plated)



COCO Disk Module (2)	\$16.95
Ground tab extensions	INCL
Disk Drives (all R.S.)	\$7.95
Gold Disk Cable 2 Drive	29.95
Four Drive Cable	39.95

USA shipping \$1.45 Can/Mex \$4.
Foreign \$7 Don't wait any longer TEXAS 5% TAX

Available at your favorite dealer or order direct from



E.A.P. CO.
P.O. BOX 14
KELLER, TEXAS 76248



(817) 498-4242

MC/VISA

+ trademark Tandy Corp

Hands On Is 'Outstanding' Educational Software

By Mark Williams

You're a primary-grade teacher. A few weeks ago, the principal appeared at your doorway carrying a box and wearing a cheerful smile. "Your computer's here!" You approach with some trepidation; after all, no one told you you were getting a computer. Besides, computers are great iron boxes that sit alone in air-conditioned rooms and foul up people's utility bills and send out department store bills for \$500, right?

Well, all of that is in the past, and you have made your peace with the computer. Now, how best to introduce your students to the computer? And can the computer really help your primary students learn concepts and skills? Those skills and concepts are important — things like colors and shapes, the concepts of bigger and smaller, faster and slower, sharing, following directions, and working independently to name a few. Can the computer do the job?

The answer is a strong, but qualified, yes. The qualification is that the success of the computer in a classroom situation depends not just on the teacher's willingness to use the computer, but on the quality of the software. Several publishers have dedicated themselves to providing high

quality educational software for school and home use on the Color Computer, and now Radio Shack has signed agreements with Walt Disney Productions and with Children's Television Workshop (creators of "Sesame Street," "Electric Company," and "Zoom") to market packages of educational programs.

This review concerns itself with one of the first of these packages, *Hands On*, by Children's Computer Workshop, an offshoot of Children's Television Workshop. It is billed as "a beginning computer experience," and is aimed at primary school-aged children. *Hands On* consists of two separate programs. The first is an art program called *Color It*, and the second is a simple word-processing program called *Blackboard*. Both programs come on disks, and require 32K Extended BASIC. Each of the programs also provides a blank disk for storing student work. In addition, both programs include a number of reproducible black-line masters of student worksheets, several laminated activity cards, and a game. The worksheets, cards, and game all tie in with the concepts dealt with in the programs. They come in colorful folders, packed in a sturdy box.

Color It is a computer literacy activity that allows the student to design and draw their own pictures. Besides being an outlet for artistic urges, this program familiarizes the student with the keyboard, as well as colors and geometric shapes. There are three levels plus a *Learning Manager* program for the teacher to use in setting up class lists and assigning a student to a particular level. Level one is the simplest, requiring little teacher supervision. (Since nearly all the directions appear on-screen as pictures, little reading ability is needed.) For students to use levels two or three, the teacher must have entered their name and a clearance for that level in the *Learning Manager* program, which controls access to those levels. The two higher levels add the ability to change color sets, shuffle colors within a picture, do horizontal or vertical flips, move, shrink, or enlarge a picture. These options were instant hits with students. At level two, the student can save a picture on his own disk. At level three, the student can allow others to access his drawings or not, as he chooses. Error trapping is comprehensive, both in the student and teacher areas of the program.

Twenty reproducible masters and laminated activity cards contain classroom activities that directly relate to one or more skills/concepts dealt with in *Color It*. A game combines the use of a grid and color and shape recognition to reproduce a pattern.

The word-processing program, *Blackboard*, is also divided into three levels and a *Learning Manager* that work in much the same way as *Color It*, except that students are working with words rather than colors and shapes. Letters can be inserted, deleted and changed, and at levels two and three, up to six screens can be saved on the student's own disk. This allows for longer stories, or for several items of information to be stored for later retrieval. Simple database management comes to second grade! At level three, screens can be titled, or addressed to another person, and can be accessed by others at the student's option. Thus, a simple electronic mail network is possible. Students working with this program should have no trouble grasping the usefulness of *E-Mail* or *WordStar*.

Although *Blackboard* could be used with first-graders, it will probably be of more use in a second, third or fourth grade classroom. Again, there are a number of classroom activities that tie in with the skills and concepts dealt with in the program. In particular, this program could be a power-

ENHANCED 1248-EP EPROM PROGRAMMER

Directly compatible with EPROMs 2508, 2716, 2532, 2732, 68732-O-1, 68764 & 64766. No personality modules required. Adapter extends capability to 2564. Menu driven, the 1248-EP is suitable for both experienced and novice operators.

Functions include: 1) ERASURE VERIFICATION; 2) COMPARE EPROM TO REFERENCE; 3) BLOCK PROGRAMMING; 4) BYTE PROGRAMMING; 5) DUMP EPROM TO RAM; 6) JUMP; 7) RETURN TO EPROM MENU.

Other features: 1) Error detection & location; 2) Intelligent algorithm reduces programming time; 3) Textool ZIF socket; 4) On-board programming supply; 5) Extra PIA port supports parallel communications with handshake; 6) Firmware in on-board EPROM.

Comes with complete documentation.

Price is \$129.95

A/D-80C ANALOG TO DIGITAL CONVERTER

- 16 A/D channels.
- 8 or 10 bit resolution
- 9K conversions/second.
- Auto-ranging or sample/hold
- Large wirewrap area for custom signal conditioning & growth.
- On-board PIA provides user control of stimulus
- On-board EPROM location for user software
- Documentation includes: data sheets on key parts, BASIC and machine language programming examples, and signal conditioning circuit diagrams

Price is \$149.95

2-PORT EXPANSION INTERFACE

- Buffered expansion interface
- Spans 1FF40-1FF5F area in half.
- Disc port uses 1FF40-1FF4F.
- Second port uses 1FF50-1FF5F
- Enables simultaneous use of disc & other devices, e.g., the 1248-EP or the A/D-80C.

Price is \$89.95

ORDERING INFORMATION

U.S. residents add \$3.00, Canadians add \$10.00 for shipping/handling. Arizona residents add 5% sales tax. Make checks/money orders payable to

COMPUTER ACCESSORIES
OF ARIZONA
5801 E. VOLTARE DRIVE
SCOTTSDALE, ARIZONA 85254
(602) 996-7589

ful stimulus for a student who is reluctant to write with pencil and paper.

Both programs were popular with students, eliciting favorable comments all around; but *Color It* received the most repeated use. I suspect that the program's appeal would not be limited to the lower grades, either. At least one student wanted to know if his teacher would let him turn in his spelling words on a disk to be read by the *Blackboard* program!

I've saved the best until last. Upon opening the box, the user discovers a well-written, 23-page teacher's manual. This manual covers everything, from detailed instructions on how to set up, connect, and power up the computer, to goals and objectives of the programs (both affective and cognitive), to detailed lesson plans for the various worksheets and activity cards. This is the best documented educational package I've seen for the Color Computer. The directions are so complete that you could give the teacher's manual to a first-time user, take away the manuals that come with the Color Computer, and still run a very good chance that the novice would have the program up and running in short order without outside help.

The one flaw is, unfortunately, a serious one. No backup of any kind is provided. Especially when working with young children, this is an invitation to disaster. A call to Radio Shack's regional education office revealed that there is a way to get a backup copy. The damaged disk must be returned to the Radio Shack Computer Center the program was purchased from. That store will order a replacement copy of the disk from Fort Worth, Texas. When the replacement copy arrives, the purchaser will be notified.

Although there is no charge for this replacement, the process could easily take weeks. Meanwhile, you are left without the central part of a very fine package of materials that may well be the basis of several weeks' learning in class. While this may be acceptable in a home environment, it is completely unacceptable in a school setting. Since the disk is encrypted, why not provide a second encrypted copy so the program can continue in use while the damaged copy is replaced? Or, why not include a utility that would make a limited number of copies (say, three), such as Random House does on their disk versions of programs for the Model III? The lack of an immediately accessible backup, or the ability to make one, is a major concern to educational purchasers.

With this exception, *Hands On* is an outstanding set of programs, well worth consideration for use at school and at home.

(Radio Shack Stores nationwide, Cat. No. 26-2539, \$99)

Hint . . .

One thing that Color BASIC owners lack is an exponential function (xy) comparable to x[y or xty. The lengthy subroutine in the *Color Basic Manual* will do the job, but for simple positive exponents you can use this single line:

```
K=1;FOR T=1 TO Y:K K*X:NEXT T
```

Try it for various values of x and y. It works.

T. Gray
Sunnybrook, Alberta

PARALLEL PRINTER INTERFACE

FOR THE RADIO SHACK COLOR COMPUTER

- * Runs any parallel printer from the Color Computer serial I/O port.
- * No hardware modifications or software patches needed. Works with all standard Color Computer commands including graphics.
- * Switch selectable baud rates from 300 to 9600.
- * All cables and connectors included.
- * 1 year warranty.
- * Most printers supply power at the parallel port. With these printers you may order your interface without the power module.
(Printers known to require the power module are:
Epson, Panasonic, and Monmesman Tally.)

- * PRICE: Model CCP-2 with modem connector & switch----- \$84.
Model CCP-1 without modem connector & switch-----\$69.

Either model without power module deduct----- \$3.
Shipping costs included in price.
Michigan residents add 4% sales tax.



CCP-1 OWNERS

UPGRADE YOUR CCP-1 TO A CCP-2 !!

Send us your CCP-1 plus \$17 (includes shipping)
we will add the necessary cable and switch.

BOTEK INSTRUMENTS

313-739-2910

4949 HAMPSHIRE, UTICA, MICH., 48087

Dealer inquiries invited

Let *Color Finance II* Manage Your Checking Account

By Frank J. Esser

The November '83 issue of *THE RAINBOW* carried a review I wrote about the *Color Finance* program. Since that time the author has made some enhancements and incorporated the *MSI Color Calendar* program. This review is about those updates and the *Color Calendar* program. For the necessary information I would suggest that you read the review in the November '83 *RAINBOW*. The previous program is as described in that review. The updates are to enhance the program and add to what was already in place. What has been added? *Color Finance II* will now print checks for you, and will give you check reconciliation on multiple checking accounts. Also included with *Color Finance II* is the *MSI Color Calendar* program.


Color Finance II comes on a single 5 1/4-inch diskette and is not write-protected. The manual is spiral bound and well designed. *Color Finance II* also requires 32K, with at least a single disk drive and a line printer. As in *Color Finance*, a cassette recorder can be used to backup data records. This is an item I like to see, especially in the area of financial and business programs. The ability to store data on magnetic tape for archival and data backup is excellent. *Color*

Finance II also uses a personality plug which is inserted into the left joystick port. If the personality plug is not in the left joystick port, *Color Finance II* will not run. It is a method to help safeguard your financial files from unwanted tampering.

The manual is of the same high quality as *Color Finance*. The new commands added to *Color Finance II* are: CALENDAR SCHEDULE, RECONCILIATION MODULE, and PAYEE FILE MAINTENANCE. The CALENDAR SCHEDULE command will get you from *Color Finance II* to *MSI Color Calendar* program. Since this program is not an integral part of *Color Finance II*, I will do its review after the updates to *Color Finance II* have been covered. Entering the 'R' will get you into the RECONCILIATION MODULE. This section is used to balance your checkbook. Actually the whole process is quite simple. Upon entering this section, you will be asked for the month/year through which you desire to balance the account. You are then asked which account you wish to balance. After these items have been entered, the checks that have not cleared the bank will appear on the screen. If an item displayed has cleared the bank, enter a 'P' after it, which stands for Posted. After all items have been marked, *Color Finance II* will display your check register balance and bank statement balance. If you have not made an error, the two should be equal. *Color Finance II* will now hold all outstanding items for your next bank statement. The addition is logical and very useful.

You can now tell at a glance which checks have or have not cleared the bank. The check WRITING MODULE is another very powerful and useful addition to this fine program. It is set up to print checks on Radio Shack's Check (form #72-124). I did not dig into the program, but since it is written in BASIC, except for the screen formatter and handler, if you prefer to use someone else's checks, surely it could be done. When you are posting checks to the check register, a check number is listed when the check is posted. If you want to enable the auto-check writing feature for this entry, then in place of a check number, you will enter 'A' followed by a two digit number. The 'A' instructs *Color Finance II* to use the automatic check writing feature on this check, the two digit number tells *Color Finance II* to whom the check should be made payable. Thus, you may have up to 99 different payees on file at any one time. I brought the feature up and ran a couple of dummy runs on my printer using just blank paper instead of the usual checks and it works beautifully. The auto-check writing feature is enabled after all the checks are entered for a given session. You have the ability to mix checks which will use the auto feature and regular checks that you have hand-written in the same session. Also, this feature will apply to all bank accounts you have in use. It is very easy to learn and very easy to use, as is all of *Color Finance II*. The addition of the ability to auto-write checks required the addition of a complete module to *Color Finance II*. This module provides the necessary maintenance functions for the payee file. That module or section is called PAYEE FILE MAINTENANCE. Upon entering an 'F', the following menu is presented:

- I = Initialize Payee File
 - L = List Payee Names
 - R = Retrieve Payee By Code
 - A = Add or Change Name/Address
 - P = Print Payee File
 - E = End Payee Maint/Return To Menu
- Enter Selection



**BIG B
PRO
QUARTERBACK**

— The
**Incredible New
Football Simulation
for the Color Computer!**

- * Pass, Run, or Kick — You call the Plays!
- * Compete with friends or challenge the computer.
- * Contains extended basic and non-extended basic versions for 16K cassette color computers.

Send \$16.95 (check or money order) for each game (Colorado residents add 3 1/2% sales tax). Allow four weeks for delivery.

Big B Software

P. O. Box 91
Broomfield, Colorado 80020

Please send me _____ game(s) @ \$16.95 each.

Name _____

Address _____

City, State, Zip _____

Let's look at each of these commands. The initialize payee file command does just that. It creates a payee file and if it already exists, it will clear it of all data. You have the ability to store 99 individual names and addresses.

The list payee names will list the first name of each payee stored on the file. Each entry is coded with a sequence number and all empty entries are shown as "PAYEE NO XX AVAILABLE."

The retrieve payee by code will view the four line name and address of a given payee when referenced by sequence number.

The add or change name/address module is used to maintain the payee file. Upon entry the file is displayed in column form. The sequence number along with the payee name is displayed. At the end you are asked if you want to change an entry, page to the next screen of payees, or return to the main menu. Selection of the page option will get a second screen full of payee entries. Selecting the change option will allow the user to either change an existing entry or add a new one. The process is repeated until the return main menu option is selected.

The print payee file option will do just that. Using this command will allow you to either print a complete reference list or a set of mailing labels, whichever you desire.

The end payee maint/return to menu will return you to *Color Finance II's* main menu.

The *Color Calendar* is now included as a part of the *Color Finance II* package so it will become a part of this review update. The *Color Calendar* program comes on the same disk as the *Color Finance II* programs, but will have to be transferred to another disk to run. There just is not enough room to hold the monthly calendar files and the monthly

data files created by *Color Finance II*. The steps necessary to move the required programs are amply described in the instruction manual. Once on its own disk, it is ready to run. *Color Calendar* is brought up by typing *RUN "CALENDAR"*. Once loaded you are presented with the following screen.

Calendar Menu

- (I) = Initialize Calendar
 - (C) = Display Calendar
 - (D) = Display Daily Entries
 - (A) = Add Daily Entries
 - (K) = Delete Daily Entries
 - (E) = End Calendar Program
- Enter Selection

Selecting 'I' clears the calendar file. A second menu appears that asks you a second time if you want to clear the file. This gives you a normal exit if you change your mind, and will leave the file intact.

Selecting 'C' brings up a second menu asking for the month and year that you want displayed. Once these questions are answered, the desired month of the desired year is displayed on the screen. The calendar entries are correct in respect to the day of the week. Also, the number of entries in the calendar file for each day in the displayed month will be indicated on the display. You are given the option of making a hard copy if so desired.

Selecting 'D' bring up the following menu:

Display Entries Menu

- (A) = List All Entries



COLOR COMPUTERS

16K std	\$ 99.95
16K Ext. BASIC	126.95
64K Ext. BASIC	169.95

CARTRIDGES

Spectaculator	\$8.95
ColorFile	8.95
Space Assault	6.95
Shooting Gallery	7.95
Chess	7.95
Microbes	6.95
Personal Finance	8.95
Micro Painter	6.95

TDP

SALE



SPECIAL 2 JOYSTICKS and a Bustout Game

Reg \$49.90
\$14.95

Project Nebula	\$ 6.95
Bustout	5.95
Polaris	7.95
Learning Lab	12.95



Line Printer 100 was \$399
Now only 199.95

ETC.

Extended BASIC (No Book)	29.95
Dust Cover CoCo I	1.99
Color Graphics Plotter G115	119.95
Diskettes (house brand) life warranty	19.95
Wico Joystick Adpt. for Atari Jyst	14.95
White cap keyboards F&CCII	39.95
64K Chips 8 set	49.95

THE COMPUTER CENTER

901-761-4565, 5512 Poplar, Memphis, TN 38119

Add \$4.90 for shipping & handling on Computers & Printers, \$2.80 on any other items-per order. Visa & M/C Accepted

(M) = Select Month
(F) = List From-To Date
Enter Selection

'A' will get a screen list of all the entries in the calendar file.
'M' will get a list of all the entries in the file for a given month.
'F' will get a list of all entries in the file that fall between two given dates. The start and end dates are entered through a prompt.

Selecting 'A' will get the following menu to appear.

MM DD TIME ENTRY

From this menu entries are made into the calendar file. As you can see you are restricted to no more than 25 characters for the entry information.

Selecting 'K' will get the same header as described in 'A', except a sequence number has been added. It is through this sequence number that the records to be deleted are referenced. This section allows you to delete records from the file. Selecting 'E' will end this session and return control to the BASIC interpreter.

I liked *Color Finance* when I reviewed that package last year. The additions that have been made are useful and enhance an already good package. The ability to reconcile your checking account through *Color Finance II* is a plus. How many times have you sat there writing out checks by hand, wondering if there is a better way. Well, with *Color Finance II*, there is. Of course, you must order preprinted checks and have a printer on your system to make it work. But if you desire to have *Color Finance II* help you manage your personal finances or help you in a small business operation, then the entry of the data in to *Color Finance II* is all that is required. By properly annotating the entry, the checks are automatically printed when the posting for that session is completed. The addition of the *Color Calendar* to the package is a real bonus. It gives you the ability to mark and remember important dates and events. It takes only a couple of minutes to see just what is on one day's entry. You can scan a month of entries or any date interval that you specify. *Color Calendar* provides all the necessary functions to properly maintain the calendar data file. The programs and documentation for *Color Calendar* are in the same fine tradition as the rest of the MSI Color programs. I find them to be of very good design in that they have no apparent pitfalls and do provide good error trapping where possible. They are well done and the documentation is clear and easy to follow. For home financial and small business applications *Color Finance II* and the CoCo are a good team.

(Delker Electronics Inc., P.O. Box 897 Dept D, Smyrna, TN 37167, disk \$69.95)



LABELIII (Reviewed in Nov. '83 Rainbow)
CHRISTMAS IS JUST AROUND THE CORNER!
Let your computer and LABELIII create your Christmas card list. With LABELIII you can develop and maintain a mailing list. Print lists or mailing labels in your choice of 1, 2, or 3 wide. Supports 3 or 4 line addresses with phone optional, FAST machine language sort by last name, first name, or zip code.
Cassette 16K EXT - Postpaid \$19.95



FILEIII - Data Management System
With FILEIII you can create and maintain records on anything you choose. Recipes, coupons, household records, financial records - you name it. You create records containing up to five fields you define. You can search, sort, modify, delete, save on tape and display on the screen or send to a printer. The program is user friendly and user proof. Prompting is extensive. A comparable program could cost much more. This one is a bargain!
Cassette 16K EXT - Postpaid \$19.95



PROGRAM FILE (Reviewed in Oct. '83 Rainbow)
Organize your cassette programs. With PROGRAM FILE you create a file of your computer programs. You can search, sort, modify, add, delete, save on tape, and display on screen or printer.
Cassette 16K EXT - Postpaid \$14.95

NEW!!



INTRODUCING! CODE CONVERTER Security System
CODE CONVERTER will protect your basic and ML programs from unauthorized use. A simple code of your choice encodes your programs. Basic program listings will be scrambled and inoperative. Machine Language will not operate. Coded programs can be copied but are useless until properly decoded.
Cassette 16K EXT - Postpaid \$19.95



ADVENTURE STARTER (Reviewed in Feb. '84 Rainbow)
Learn to play those adventures the painless way. You start with a simple adventure and move into an intermediate. Two complete separate adventures plus hints and tips on adventuring. Finish this and you are ready for ATLANTIS!
Cassette 16K EXT - Postpaid \$17.95



ATLANTIS ADVENTURE (Reviewed in May '84 Rainbow)
This one is tough! We challenge you to complete this in 30 days! If you can we will send you any program we sell - Postpaid - at absolutely no charge. You start on a disabled sub near the lost city of Atlantis. You must get the sub (and yourself) safely to the surface.
Cassette 16K EXT - Postpaid \$21.95



ESPIONAGE ISLAND ADVENTURE (Reviewed June '84)
You have been dropped off on a deserted island by submarine. You must recover some top secret microfilm and signal the sub to pick you up. Problems abound in this 32K adventure.
32K EXT - Postpaid Disk - \$20.95 Cassette \$17.95



KINGDOM OF BASHAN
Our most involved adventure to date. Bashan has a large vocabulary and some unique problems to solve. You must enter BASHAN (not easy), gather the ten treasures of the kingdom while staying alive (even harder), and return to the starting point (harder yet). If you can get the maximum 200 points in this you are an expert!
32K EXT - Postpaid Disk - \$20.95 Cassette \$17.95

FOUR MILE ISLAND (Reviewed May '84)
You are trapped inside a disabled nuclear power plant. The reactor is running away! You must bring the reactor to a cold shutdown and prevent the "China Syndrome". Can you save the plant (and yourself)? It's not easy!
Cassette 16K EXT - Postpaid \$17.95

*C.O.D. orders please add \$t.50
*No delay for personal checks

IN A HURRY? CALL OUR HOOT LINE: (615) 238-9458



OWLS NEST SOFTWARE
P.O. BOX 579, OOLTEWAH, TN 37363



Kingdom Of Bashan — For The High-Spirited Adventurer

At first glance, it looks like another easy Adventure for Thorafin Crimsonblade, Adventurer extraordinaire, as he silently slips the cassette tape containing *Kingdom of Bashan* by Owls Nest Software into the cassette player. As he enters the temple Adventure by slyly typing *CLOADM*, he sees a lovely title page that reminds him of his exploits in the Far East. But of course, that is another story. As he begins the Adventure in earnest, he finds that this could be his toughest challenge.

Indeed, Thorafin feigned death more than a few times during his visit to the *Kingdom of Bashan*, but telling the story in full would ruin the exploits of other true Adventurers who choose to plunder at home on their own computers, so I will include the outline of the Adventure program, and not that of Thorafin's travels.

This Adventure program is a top notch, high quality program that is geared to the advanced Adventurer. The program took me over 50 hours of playing time to solve, and it required all the help messages and clues I could squeeze out of the program before I could finally score the necessary 200 points.

The Adventure itself is set in an Arabian-like setting which is unsuited for the faint-hearted. Getting to the temple, finding the 10 items and managing to leave alive can be difficult at best, but after this is accomplished, the Adventurer really feels like he has done something worthwhile. The program is well written, and includes a help command and several commands to list available verbs, objects and rooms. Also included are facilities to save the Adventure in progress and (a nice touch) to backup the program itself. *Kingdom of Bashan* is probably the most complete and thoroughly written one I have seen. As a result, it takes over 29K of program and variable storage, and will not load with the disk ROM pack enabled on a 32K machine. Although the help and verb listing commands are included, do not expect to be walked through this one. It is meant to be challenging and lives up to its purpose every step of the way. Also, the writers have done something that makes it certain that you will not cheat your way through the Adventure because the program cannot be listed, so you can't try to figure out the program logic that way.

Overall, I would recommend the *Kingdom of Bashan* to anyone who really wants to be thoroughly tested by a well-written Adventure. First-time Adventurers, however, should stay away until they have solved a few other Adventures. I found that \$17.95 is a small contribution for the amount of Adventuring it gives.

(Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363,
32K ECB cassette \$17.95 postpaid.)

— Eric Oberle

DYNAMITE+™

"THE CODE BUSTER"
disassembles any 6809 or 6800
machine code program into beautiful source

- Learn to program like the experts!
- Adapt existing programs to your needs!
- Convert your 6800 programs to 6809!
- Automatic LABEL generation.
- Allows specifying FCB's, FCC's, FDB's, etc.
- Constants input from DISK or CONSOLE.
- Automatically uses system variable NAMES.
- Output to console, printer, or disk file.
- Available for all popular 6809 operating systems.



FLEX™ \$100 per copy; specify 5" or 8" diskette.
OS-9™ \$150 per copy; specify 5" or 8" diskette.
UniFLEX™ \$300 per copy; 8" diskette only.

For a free sample disassembly that'll convince you DYNAMITE+ is the world's best disassembler, send us your name, address, and the name of your operating system.

NEW

**CoCo
OS-9
VERSION**

\$59.95

DISASSEMBLES OS-9, FLEX, DOS FILES

Order your DYNAMITE+ today!

See your local DYNAMITE+ dealer, or order directly from CSC at the address below. We accept telephone orders from 10 am to 6 pm, Monday through Friday. Call us at 314-576-5020. Your VISA or MasterCard is welcome. Orders outside North America add \$5 per copy. Please specify diskette size for FLEX or OS-9 versions.

Computer Systems Center
13461 Olive Blvd.
Chesterfield, MO 63017
(314) 576-5020



UniFLEX software prices include maintenance
for the first year.

DYNAMITE+ is a trademark of Computer Systems Center.



FLEX and UniFLEX are trademarks of TSC.
OS-9 is a trademark of Microware and Motorola.
Dealer inquiries welcome.



Master Your Files With *Masterfile*

Sooner or later after you have had your computer for a while, those inevitable words will be heard: "I know that program is on one of these things somewhere." What you probably need is some sort of program to catalog your files. *Masterfile* is one such program used to catalog diskettes.

My review package came with two diskettes, both identical, and a seven-page instruction manual. *Masterfile* requires a 32K Extended Color BASIC machine and at least one disk drive. It will also work with two drives and provides full user prompts for switching diskettes with either one or two drives. The program is completely menu-driven and very simple to use.

The manual begins with a discussion of file organization and the necessary steps to get started. *Masterfile* places your files into user-created categories called "modules." A module may contain games, utilities, etc., or anything you like. The module name may be up to 12 characters long, but only the first eight are used to determine uniqueness. Each module may be up to 500 files long and you may have over 15 full modules, giving a total capacity of over 7,500 files. *Masterfile* inventories each diskette as a separate volume and you may assign a three-character alphanumeric volume name to each. Using *Masterfile*'s optional volume write feature, you can write your volume designation on an unused portion of each diskette's directory. However, you must remove any write-protect tabs to utilize this feature.

The master diskette contains two versions of the *Masterfile* program. One of these uses high speed pokes and the other does not. The manual provides a small test program to see if you may use the high speed version since some computers have problems operating in this mode. From here you are instructed to make a backup copy of your master diskette and retain only the version of *Masterfile* you wish to use, putting your original diskette away for safe keeping.

Running *MFIL*E begins execution of the program. If you have not created any modules yet, you are greeted by the main menu; otherwise, you receive a listing of existing modules, each preceded by a number. Entering the desired modules number will load that module and then bring up the main menu.

The main menu consists of 11 options as follows:

1) Module operations — brings up sub-menu to list modules, print a directory of modules, load a module, kill a module, rename a module, or return to main menu.

2) Update directory (catalog of files) — you may add a new diskette to your directory, modify the contents of a diskette already in the directory, or return to the main menu.

3) Create directory (module) — allows you to create a new module.

4) List directory to screen — you may list every file in a module, every file on a particular volume (disk), or return to main menu.

5) Print directory — provides a dated paper copy of your directory within a module.

6) Sort files — sorts, in ascending order, all files within a module.

7) Find file — find one file or all files beginning with a specific string or having a specific extension. Uses a slash, period, or space as a delimiter.

8) Execute program — allows single-key loading and executing of a program. Some programs may not load due to the size of *Masterfile*.

9) Disk directory — invoke the standard *DIR* command.

10) Verify volume — reads the volume number *Masterfile* placed on a diskette, provided you used the write volume option.

11) Return to BASIC — terminate execution of *Masterfile*.

Masterfile is well-documented and easy to use. The usage of the word "directory" becomes confusing at times since it refers to both your catalog of files and an actual disk directory. One thing to be aware of is that only an entire diskette may be allocated to a single module. This means that placing programs that belong in different modules on the same diskette should not be done. Also, *Masterfile* has a menu option to kill a module but not a single volume. The only way I have found to do this is to place a blank formatted diskette into your drive, and using the "update directory" modify option, give *Masterfile* the volume number you wish to remove. The modify option will remove this volume and then rebuild it, but with no files. This seems to make the volume disappear from the directory of disks. A kill volume option would be a definite plus. Another possible enhancement would be to utilize the "write volume" option as a safety feature to prevent you from updating the wrong volume number in your directory. That is, you can specify an update on volume 01A but place 02A into your drive. Volume 01A will be removed and rebuilt, but will contain the files from volume 02A instead of the correct ones. To be safe, you must use the "verify volume" option before using the "update directory" option.

(Sofge Enterprises, P.O. Box 309, Hilliard, FL 32046,
\$19.95, 32K disk)

— Larry Birkenfeld

One-Liner Contest Winner . . .

This program is fairly simple, but it produces some rather interesting results. So type it in, let it run through a couple of times and you'll see how good graphics on the CoCo can be. Be sure to run it on a color TV or color monitor.

The listing:

```
1 PMODE4:PCLS1:SCREEN1,1:FORI=1T
06:N(I)=RND(256)-1:NEXTI:FORY=-1
TO190STEP6:FORI=1TO6:POKE178,N(I)
):LINE(0,Y+I)-(255,Y+I),PSET:NEX
TI:NEXTY:RUN
```

John Sciarabba
Rochester, NY

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.)

Pilgrim's Progress: A Good, Religious Adventure

Pilgrim's Progress is an Adventure in learning and is oriented towards the Christian CoCo user. Many of the decisions made by the player must be tempered by common Christian teaching and behavior, and you may find yourself less successful in scoring in the Adventure if you are not schooled in the Bible.

The user must discover the commands which will work in the Adventure. Most are easy to discover and figure out in the appropriate situations, but some discoveries would be aided by Christian training. There are 30 commands possible so you are not limited in your choice. And more than one command word may accomplish the same thing. The object of the game is to obtain all nine fruits of the spirit by exploring the 26 locations and acting or exploring in a Christian way. The nine fruits which you seek are: love, joy, peace, long-suffering, gentleness, goodness, faith, meekness and temperance. For example, to get one of the fruits of the spirit, such as meekness, you must be meek at some point in the Adventure. The command *SCORE* will list the fruits you have obtained. Any objects found and retrieved, can be seen

by the *INV* command, which stands for inventory. An interesting 'Help' is the reference to scripture which gives clues to some situations. Saving an Adventure is also possible and that is always a welcome feature in any Adventure.

The program is an adaptation of the John Bunyan masterpiece *Pilgrim's Progress* as stated in the documentation. I did not have a copy of that material but perhaps a copy would aid a player in solving the Adventure. Of course, one could also *LIST* the program to aid his progress. As for the difficulty level, I feel it is not an easy Adventure and will take some persistent effort by even the most religious player. There are a couple of seemingly endless mazes which I find useless since they lack challenge and usually require you to *BREAK* and *RUN* the program over. Not mentioned in the documentation is that hints and a solution map can be acquired by sending a SASE to the company. This is a good feature since some people may want to use the program in a church study class and it is always nice if the instructor has all the answers, especially in an Adventure.

So although this may not be a program for the pure Adventure enthusiast, I feel confident that those with strong Christian orientation will find it a delightful and edifying Adventure.

(Quality Christian Software, P.O. Box 1899, Duncan, OK 73534, 16K ECB tape \$17.99)

— Douglas Pirro

One Stop Shopping For the Color Computer

Disk Charger from

REITZ™

Make your disk system run
up to 6 times faster!

For units with Non Radio Shack Drives **\$21.95**

REITZ™ Serial to Parallel CONVERTER

Transfer data to your printer
at up to 9600 BAUD

\$59.95

Reitz™ Diskettes Lifetime Guarantee 10 pack with labels and Plastic Storage Box!

10 SS/DD . . . \$24.95 includes TYVEC Sleeve

10 DS/DD . . . \$34.95

100 Bulk Packed SS/DD Disks only **\$1.90/ea.**

INTRODUCING:

MUSICA II!

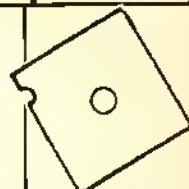
from Speech Systems

Now print music on your EPSON

or Gemini Printer! **\$39.95** disk **\$34.95** tape

We also carry software from these fine vendors:

Computerware	Softlaw	Skyline
Prickly Pear	Elgen	Sectral Assoc.
Tom Mix	Double Density	Moreton Bay



FLIP IT!
Punch
your
disks
for
double
the
storage

\$9.95

1-(419)-537-9533

1-(419)-537-1432

REITZ™
COMPUTER CENTER

3170 W. Central Ave.
Westgate Meadows Shopping Center
Toledo, Ohio 43606



MasterCard

Please include phone number with all orders. Include \$5.00 shipping for all hardware orders and \$2.00 for all software orders. Ohio residents please add 6% state sales tax.

Personal Bookkeeping 84 Keeps Track Of Your Accounts

By Michael Hunt

This is one of the more difficult reviews I have written for THE RAINBOW. I can't decide whether I like this program or not. *Personal Bookkeeping 84* has some really interesting features I have not seen in similar programs that cost much more. Most of the program is user friendly and practically foolproof. On the other hand, there are some things about this program that I find very displeasing and feel would prove to be very cumbersome for most users, especially if the user doesn't want to get involved in making minor changes in the program.

Personal Bookkeeping 84 will allow you to keep track of up to 25 accounts, such as your checking accounts, savings accounts, CD's, bonds, stocks, etc. Each account is set up on disk in what the author calls a dataset. Each dataset can keep a record of the type account, location (such as bank name), balance, interest, and maturity dates. The program is designed to allow you to set up one or more of the datasets as checking accounts. One thing you may not like about the program is that if you have more than one checking account you are trying to keep track of, only the first one (if it's in the first dataset) will automatically be reconciled to your bank statement. I did not like the fact that there are 26 expense categories preset to use. Unlike other programs of this nature, they are not easily changed if you want different categories than the author uses. They can be changed but you must rewrite a line of the program in order to do so. Of the 26 expense categories the author provided, only one can be defined by the user without modifying the program.

There are some excellent features the author included. Data entry is rather easy. You are prompted for the information needed and sound is used quite effectively to let you know what CoCo thinks of the information you are entering. For example, a very low tone indicates a warning, error, rejected input, or the correction mode. Medium tones are used to prompt you for data entry, and high brief tones are used to indicate automatic internal activities. With this feature you don't need to watch the screen as you input data because if you enter the wrong information, CoCo will let you know. Entry of data is also facilitated by what the author describes as "intelligent" data entry. For instance, if

you are entering the date for a particular transaction and it falls on the fourth, just enter four since there are no months with 40 days. Also extensive error checks stop entry of extreme values and require you to confirm suspiciously large values.

You are allowed to make seven different types of data entries in this program (DEPOSIT, WITHDRAWAL, CHECK, INTEREST, EXPENSE, \$ RECEIVED, AND SPLIT CHECK). I think most of these are self-explanatory but EXPENSE is used for cash expenditures and SPLIT CHECK is used to record a check without assigning it to a particular expense category. This is handy if you write a check that pays for more than one expense category, such as credit card payments. Another feature I really like takes care of EXTRAORDINARY EXPENSES. This will allow the printed reports to provide you with a more realistic picture of your monthly and yearly expenditures. These extraordinary expenditures will not appear on monthly reports, and on the yearly report they are totaled separately. For each record entered, you may include an 11-character note. This note can be useful later if you need to search for particular entries.

One thing I found irritating about data entry was when entering check numbers you are only allowed three digits. The program will only allow check number entries between 100 and 999. I found I could not get used to this and many times tried to enter a four-digit number. Well, as soon as the third digit is entered it is automatically accepted, so you either have to make a correction or if you didn't realize your mistake, check number 1873 is actually entered as 187. The reason the author did this was to allow maximum entries in limited memory, but I personally find it objectionable.

Another item you cannot enter is any service charges that you may have on your accounts. The program is set up assuming you are going to make entries on a daily basis. Therefore, when you select the enter data mode from the menu you are asked for the date. Respond with an input between one and 31. Then enter all the transactions you have for that day. If you are like me and normally enter several days transactions on a weekly basis, you have to return to the main menu and select the data entry mode for each new day.

Once you have data entered into the computer, it is fairly easy to retrieve. You are allowed to search by expense category, type of transaction (deposit, check, or withdrawal), or by the 11-character note you entered. You can also view the information sequentially in either a forward or reverse direction.

There are several different printed reports you can generate with this program. They are: ACCOUNT STATEMENT, LIST RECENT ACCOUNT TRANSACTIONS, LIST EXPENSE ENTRIES, MONTHLY EXPENSE TOTAL, and YEARLY TOTALS. The ACCOUNT STATEMENT will prepare a complete printed statement of all accounts, which contains all information about each account. LIST RECENT ACCOUNT TRANSACTIONS will provide a report of all recent transactions such as checks written, deposits and withdrawals made for a specific account. The transactions are listed to-date, from the beginning of the last month. LIST EXPENSE ENTRIES will provide you a printout of all entries for a specific expense category. You can have this information printed for the whole year-to-date or from a certain month to the current date. MONTHLY EXPENSE TOTAL will provide a printout of the last four or eight month's expenses. If you ask for the report for the last eight months then you actually will get



a report that is printed in two-month intervals. The last column of this report compares expenses of the current interval with expenses of current months. I'm not sure how this feature is supposed to work. I didn't have time to enter data for four months and the documentation is not very clear if the current month is being compared to the average of the preceding months or not.

After making the request for the report the computer will prepare a color graph of the expenses to display on the screen before beginning the printout. The expenses for this screen display are lumped together so they can all be on one screen page. For example, rent, electric, household, and fire insurance are lumped together under "Home" for one category on the graph. Finally, YEARLY TOTALS will provide a report for the entire year. This report can provide an itemized printout of up to nine expense categories if you want. It will also print out the EXTRAORDINARY EXPENSES you had during the year. After this information the main report is printed. It includes five columns of information about each expense category. The first column is for untaxed expenses. The second column is for taxed expenses. The third column is a total of the first two. The fourth column adds the extraordinary expenses to the total of the third column. And the last column prints the percentage of the individual expense to total expenses.

There are three more features to this program I really like and would like to see more software authors include these as standard routines in any program requiring extensive data entry. The first two require two drives to use. Since I only have one drive I wasn't able to test them out. First, there is a BACKUP command you can use to backup your data on another disk. You would use this command the first time you started using the program. I believe the author used disk BASIC's standard backup here but he added a feature. In this mode and the next the computer will check for insertion of the disks in the proper drives. If they are reversed you will be advised to switch disks. This is an excellent feature.

The second feature is "DUPE NEW ENTRIES." This works similar to backup only you would use it after your initial setup of the main and backup disk. It will only duplicate the new entries you have made to the program. You may wonder why there are two similar routines. The reason is that disk basic's backup command is relatively slow. By only duplicating data that is new, you can save time. The third feature allows you to copy the disk's directory to track 34 of the disk and then recover it if ever necessary. Apparently most disk faults lie in the directory track so having a spare could be a data saver.

The documentation that comes with the package is 19 typewritten pages long. There are parts that I don't feel are very clear and should be rewritten. In fact, I would suggest an additional two or three pages should be written in a tutorial format to help the user better understand what the package will do. To use the program you need 32K Extended BASIC, at least one drive and a printer.

I think this package has the potential to be outstanding with a few changes. As it stands now I would only recommend it to someone who has enough knowledge of BASIC to make the package truly useful to them.

(AMDT-STARDANCERS, 762 Brady Avenue, Bronx, NY 10462, \$27.95, \$1.50 S/H)

What Does Dugger's Growing Systems Grow?

We grow C Compilers (\$120 value)
generate fast, efficient code
longs, floats, most operators
FLEX* \$75.00
new OS-9* \$59.95
COCO DOS \$49.95

We grow Relocatable Macro Assemblers
(\$150 value)
Assembler, linker, library builder
symbols up to 32 characters
"fortran-like" common
FLEX* \$75.00
new OS-9* \$75.00
COCO DOS \$49.95

We grow Orchids
Odontoglossums
write for catalog and price list

We grow HI RES OS-9 "Windows"
52 x 24 hi-res display
new cursor control
multi-window displaying
OS-9* \$34.95

We grow Orchids
intergeneric hybrids
write for catalog and price list


We grow OS-9 Experts
Over 6 years experience with OS-9
Used in development of major project
Experts in both levels 1 and 2

Quality
quality at an affordable price
all products tested and proven

Solid Authorship Royalties
royalties up to 20% of selling price
Only quality products accepted

ORDER NOW! YOU OWE IT TO YOURSELF

All orders add \$3.00 for shipping
VISA and MC welcomed
Foreign orders add 15%
California orders add 6%

For more information write  or call:

DUGGER'S GROWING SYSTEMS

Post Office Box 305
Solana Beach, Calif. 92075
(619) 755-4373

Technical information 6 am to 8 am PDT only
Dealer inquiries welcome

*Flex—trademark of TSC, OS-9 trademark of Microware

Elusive Adventure In *Evasion*

Evasion is a text Adventure written in Extended Color BASIC. Now, before you go writing this off as just another BASIC Adventure program, read the review and let it stand on its own. This Adventure adds a new twist to the standard Adventure pattern. In almost all Adventures, when you solve it once, you can solve it over and over again in the same way. *Evasion* adds a new twist by changing the location of some of the objects and changing some names. This adds interest to keep you playing the Adventure even after you have solved it for the first time.

The instruction sheet that comes with *Evasion* is a photocopy of the basics of how to load and run the Adventure. It also gives you an idea of what you have to do.

Your mission, very simply, is to radio a British submarine to come and pick you up. You start out in the forest near a German prison camp you just escaped from. *Evasion* is written very smoothly, making it easy to play. It does use some German words, which for those of you who don't know German, or can't find a German-American Dictionary, can be very confusing. This Adventure has one thing for all of you who always wondered how you could carry around five or more items and still move freely — a bag to put things in. *Evasion* has many objects to deal with and, if you get stuck, try and use the objects together in different ways. *Evasion* also gives you a list of all the verbs it knows at the beginning of the program.

A small annoyance that disk users have to endure is that the program will not run with the disk cartridge inserted. To run both *Evasion* and *Mother Lode* (see below) you must remove the disk cartridge (because it needs the extra 2K that the disk cartridge uses). This is a pair of programs that really uses a full 32K of memory. The repeated removal and insertion of the disk cartridge could cause some problems, so I suggest that once you unplug the disk cartridge you leave it unplugged for awhile.

Mother Lode is a free Adventure program that you can get when you buy *Evasion*. *Mother Lode* is a search for the mother lode of gold (what else?). The instruction sheet that comes with it is a photocopy of the instructions and the basics of how to play it. *Mother Lode* is not like most other

text Adventures. You don't type in the words for what you want done, but you simply select from a "choose" list of up to four choices. It can get boring pretty fast, with a limited number of choices. To solve this Adventure all you have to do is choose selections in the correct order. Because of this fact, *Mother Lode* would be good for someone who has never played an Adventure before. *Mother Lode* is a relatively easy Adventure to solve. A so-so Adventure, but not bad for being a free program.

Overall, *Evasion* has the potential to keep you working at it for twice as long as regular Adventures. With this Adventure's wide variety of happenings and the free Adventure you get, this package is quite a deal. As a veteran of many Adventures, I would rate this one as medium in terms of toughness to solve. To become good at *Evasion*, it does require being able to figure out how objects work together.

(Pal Creations, 10456 Amantha Ave., San Diego, CA 92126,
tape \$19.95)

— Jeffrey Loeliger

One-Liner Contest Winner . . .

Here's one of our favorites at THE RAINBOW. Type in the program, *RUN* and you'll see stars!

The listing:

```
Ø PMODE4,1:PCLS:SCREEN1,1:FORB=1
TO175:CIRCLE(128,191),B,,.25:NEX
TB:DRAW"BM128,148E3U4H1U1E1R1F1D
1G1L1D2R2L4R2D2F2":FOR5=1TO25Ø:X
=RND(256)-1:Y=RND(148):C=RND(9)-
1:PSET(X,Y,C):NEXT:FORR=1TO7:CIR
CLE(235,20),R:NEXT:FORB=1TO9999:
NEXT
```

Michael Cooney
Mansfield, OH

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.)



*until you see the only package that
integrates database, word processing,
spread sheet, communications and
graphics!*

Find the TIP in next months issue!

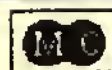
*It'll be ready for shipping at a special price
November 1, 1984.*

DATAWARE

INTERNATIONAL



1-416-529-1319



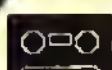
GRAPHIC MASTER is a program in a class by itself. This extremely powerful, yet compact program adds **30 NEW COMMANDS** to any version of **AS COCO BASIC**. The commands are more versatile and operate up to **60 TIMES FASTER** than Extended Basic. Software sprights, dual page flipping, vertical scroll, polygon and dye are just a few of the features you will be able to use in your programs. **GRAPHIC MASTER** includes a spright editor, demo program and **60 PAGE MANUAL** with vinyl binder.

GRAPHIC MASTER

NOT



PROTECTED



\$42.95 US

\$49.95 Cdn



\$46.95 US

\$53.95 Cdn

NOT

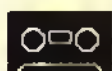


PROTECTED

TEXT MASTER

TEHTMASTER is the most powerful and comprehensive text utility program that is available for the **COCO**. 24 printing sizes, printer echo, key click and key repeat, underlining, English error messages, even proportional spacing and mirror printing are just some of the features of **TEHTMASTER** that put it one step ahead of the rest. If you wish you may design your own character set and keyboard layout. **TEHTMASTER** comes with an extensive manual, demo program, character editor and 3 ring binder.

**REQUIRES
64K**



\$25.95 US

\$29.95 Cdn



\$29.95 US

\$33.95 Cdn

+ \$2.50 S/H

DATAWARE

INTERNATIONAL

125 SOUTH FIFTH STREET
LEWISTON, N.Y. 14092

DATAWARE

INTERNATIONAL

420 FERGUSON AVE. N.
HAMILTON, ONT., L8L 4Y9

Chart Your Family Tree With *Ancestors 2.0*

If there is an area in the CoCo world which has been more or less neglected, it is the field of genealogy. I will admit there are programs which were aimed at the genealogist, but there is nowhere near the choice one has in other fields. And there are fewer genealogy programs for the Color Computer compared with offerings for other machines.

Glenn Knight's tape program, *Family*, was one of the first real breakthroughs for me. It was a light in the forest.

Within the limitations of the tape files, *Family* was superb. Then, a few months later, *Family* owners got a card from Glenn Knight telling them of this great new program, *Ancestors*. Not only did Glenn say it was a good program, he said he had cooperated with the writer, Christopher Meek, to produce a method by which *Family* files could be transferred to *Ancestors* and still be used. That program was *Ancestors 1.1* and I bought it. *Ancestors 2.0* is a complete update of the first program and a real advance for the genealogist. There are several requirements of the genealogist which I would like to describe before reviewing *Ancestors 2.0*. First, there is a need for a sufficient number of files with appropriate information, much of which is standard to all genealogists. There is also a need to express that information in charts (family tree) and records (family record sheets). There is the additional need for the ability to call up individual records, but to link them to other records in the file. That is a big order for any computer and especially big when you consider the memory constrictions of 32K (or even 64K). *Ancestors 2.0* does all of these things for you even if a bit slowly!

Since I have been using the granddaddy of this program for many moons, this is something more than a cursory review. I know the improvements in the 2.0 programs and I have experienced any shortcomings it may have been designed to meet. There was no family tree chart with the original program, but there is with the 2.0 version. It is a very abbreviated chart, but Chris Meek told me he is working on an upgrade because some other folks had mentioned it.

By the way, if you own *Ancestors 1.1* your files are not quite compatible with 2.0. Have no fear, Chris has a fix which is part of the upgrade for former owners.

One of the most disconcerting features of the old *Ancestors* program was that it searched the world every time you asked it for a record. The 2.0 version has rearranged the flags and that does not happen now. That is also the cause of the difference in the files.

Ancestors, written in BASIC, is a user-friendly, menu-oriented program which is very easy to use. The current edition will adapt to one or two disks and 16 or 32K. Those parameters are set in the loading program which accompanies the billboard.

The documentation is sufficient, and presupposes some knowledge of genealogy. There are eight pages printed on both sides. The various sections are numbered, but there is no index.

When you begin this program there is a sub-program which you can use to initiate the file disk. The routine permits you to create up to 500 individual direct access files

which will be used by the program. Each file has 22 categories. These may be retrieved in two fields; name and record number. They are linked through other relational fields such as father's and mother's number and spouse's number. It is a very neat way to file the needed records and produce them in an orderly fashion.

Many of the file manipulations and searchings of *Ancestors* consume a great deal of time, but the result is well worth it. This program does not snap right back at you, but it does give you the right answers in the accepted form.

In addition to producing the three-generation family tree and a family group sheet showing several levels of relationship, it prints blank forms for both of these activities. That is almost worth the price of the program to the genealogist who uses scores of such forms in his research. I was able to make copies of several group sheets for a distant cousin, and even with the slow search of ancestors and my stodgy old DMP-100 I got them done 20 times faster with *Ancestors* and with less aggravation, too.

This program can be adapted to your printer. It is programmed for a DMP-400, but if you know the codes, Chris will tell you the places to put them.

The author tells me he is anticipating making the three-generation family chart into a five-generation chart which would meet the requirements of more genealogists.

There is something very comforting about Chris Meek and his response to the user. He sent me a two-page letter and documentation to help me with a problem I had. It was definitive information and was presented in such a way that I knew the author really cares about the programs he sells.

After having used *Ancestors 1.1* for some time, I feel free to say *Ancestors 2.0* is a welcome improvement which makes a valuable asset more valuable to every genealogist. If you are operating under 1.1 you can upgrade for \$10. If you don't have a genealogical program, it is a good place to start.

(Autumn Color Software, 4132 Lay Street, Des Moines, IA 50317, \$39.95, disk only)

— Howard Lee Ball

One-Liner Contest Winner . . .

Here's a tribute to science fiction buffs. Type *RUN* and a rocket, planet and stars appear.

The listing:

```
1 PMODE4,1:PCLS:SCREEN1,1:DRAW"B
M118,99M106,107M104,113M78,133M7
1,152M93,141M108,119M117,117M126
,105M113,111M118,99":PAINT(88,13
5),1,1:FORX=1TO99:PSET(RND(255),
RND(199),1):NEXTX:PMODE3,1:CIRCL
E(230,168),69,3:PAINT(230,168),3
,3:FORX=1TO9999:NEXTX
```

Charlie Fulp
South Boston, VA

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.)

Command The Briny Depths With *Gray Lady*

The last time I was in a submarine was at Disneyland — it was a fun ride. You got in, the ship dived and you viewed the wonders of the deep through a porthole. It didn't really matter that the water was only five feet deep and the atomic submarine was rolling around on tracks in a man-made lake; like everything in the magic kingdom, if you wished hard enough it became real.

In keeping with the non-violent character of the park, the submarine didn't torpedo anything or launch any missiles. Unlike Disneyland, the subject of this review, *Gray Lady*, allows you to exercise your latent predatory tendencies all you want.

In this game, you are a submarine commander trying to sink the enemy. To succeed in this four-screen, arcade-type game, you shoot vertically launched torpedos at four types of enemy ships, moored mines and depth charges. If you can beat the clock (about one minute), and destroy at least 40 percent of the enemy forces on each screen, you advance to the next screen.

Although you are the commander, you view the battle from outside the ship. Your submarine is at a constant depth. The sub is controlled by moving the joystick left or

right until you feel you are in position to launch your torpedo and blow up an enemy ship sailing across the surface of the water. The smaller and faster the ship, the more points scored. If you're good enough, you may advance to the next screen, with added obstacles (mines and depth charges) to hinder your sinking of the ship.

The game is enhanced by the addition of voice. Utilizing a Voice Pak with a Votrax SC-01 speech synthesizer and Del Software's *Translate* program, *Gray Lady* will talk to you. This was the first talking machine language program I've used with my Spectrum Projects Voice-Pak. The graphics are very nice and the speech is understandable when compared to the BASIC talking programs. Although used sparingly, speech adds a nice dimension to the game. If you don't have a Voice-Pak it plays the same way only without speech.

The game, although well executed, offers limited control over the submarine — only left, right and fire controls. There are not a lot of things happening to hold your attention. After zooming left and right on the screen, and shooting at ships for a couple of rounds, I wanted to surface and do something else.

Despite its limitations, I enjoyed commanding the *Gray Lady*.

(Jarb Software/Hardware, 1636 D. Ave., Suite C, National City, CA 92050. Requires 32K ECB, speech requires SC-01 Voice Pak, cassette \$19.95, disk \$24.95.)

— Bruce Rothmel

FIVE NEW EDUCATIONAL PROGRAMS!

FROM

CREATIVE TECHNICAL CONSULTANTS
AN ESTABLISHED LEADER IN

- EDUCATIONAL PROGRAMS AND GAMES
- PROGRAMMING AND CLASSROOM UTILITIES
- CABLES AND JOYSTICK HARDWARE

SUPER SPELLER. Students learn by playing spelling games with their own lists of spelling words and definitions, synonyms or antonyms. Grades 1-9.

MATH FLASH CARDS. A computer version of the time-proven flashcard technique for learning sums, differences, products and quotients. Grades 1-6.

MATH WORD PROBLEMS. Generate and solve unique word problems from your own list of subjects and objects. Menu offers choice of weights and measures, D = R x T, money or time. Grades 3-12.

METRIC MIND. A drill program in metric/English conversion with five skill levels. Grades 3-12.

ROMAN NUMERALS. A drill program in Roman/Arabic numeral conversion with five skill levels. Grades 3-12.

OTHER BEST-SELLERS FROM CREATIVE TECHNICAL CONSULTANTS

ALPHABET SOUP
CUSTOM FLASHCARDS
MUSICAL STRINGS

COLOR MATH QUIZ
FRACTION MATH QUIZ
DECIMAL MATH QUIZ

ALL OF THE ABOVE PROGRAMS ARE AVAILABLE ON TAPE FOR THE COLOR COMPUTER WITH 16 K EXTENDED BASIC. THE PRICE IS \$15.95 EACH OR \$41.95 FOR ANY THREE. PLUS \$2.00 PER ORDER FOR SHIPPING AND HANDLING (U.S. FUNDS ONLY). SEND FOR FREE CATALOG WITH COMPLETE PRODUCT DESCRIPTIONS.



creative
technical
consultants

P.O. Box 652 Cedar Crest, NM 87008



OS-9™ SOFTWARE FOR COCO

SDISK—Standard disk driver module allows the use of 35, 40, or 80 track single and double sided drives with CoCo OS-9 plus you gain the ability to read/write/format the standard OS-9 single and double density disk formats used on other OS-9 systems. **\$29.95**

BOOTFIX—To make bootable double-sided disks **\$9.95**

SDISK + BOOTFIX—when ordered together **\$35.95**

FILTER KIT #1—Eleven utilities used as filters (with pipes) to give you "wild card" directory lists, copies, deletes, moves, lists, pagination, etc. **\$29.95**

FILTER KIT #2—Command Macro Generator to build new commands by combining old ones, and 9 other utilities. **\$29.95**

HACKER'S KIT #1—Disassembler and memory dump/fill utilities allow you to disassemble OS-9 assembly code from disk or memory. **\$24.95**

Send SASE for current catalog.

Terms: Prepaid check, MO, Visa, Mastercard or COD. Add \$1 S&H, (COD \$3 extra).

D.P. Johnson, 7655 S.W. Cedarcrest St.
Portland, OR 97223 (503) 244-8152

(We appreciate your calling between 9-11 AM Pacific Time.)

OS-9 is a trademark of Microware and Motorola Inc.

Pre-Schoolers' Educational Fun With *First Games*

First Games is a well-designed package of fun educational games for pre-schoolers ages three through six. The package includes a printed card with descriptions of available menus, games and instructions with just the right amount of detail. The programs are written in BASIC and require a 32K Extended BASIC System. The tape gave no problems in the loading process, and was used several times. With youngsters of four, five, and seven, that's amazing!

The games include exercises on such things as matching colors, letters and shapes, as well as counting and recognition of lowercase letters, memory exercise and 'which one is different' selections. The educational value for young ones is first class. My four-year-old took to these immediately.

There is a primary menu which gives three selections as follows:

- A. Color Number and Memory Shapes
- B. Color House and Alphabet Shapes
- C. Which Is Different and Counting Blocks

The directions give sufficient descriptions and instructions for making selections and returning to the menu. The only problem I observed in the entire process had to do with

the menus. It appears that in order to return to the primary menu you must complete a game. If you return to a menu during a game you may only select from the second level menu. More than likely you would want to get to the primary menu to get a different game. A couple of the games take longer to play to completion and if you are not doing well you may want to get out of it. You can always use the BREAK key and RUN the program again. This problem was minor and should not defer purchase of these programs if you can use or want them.

The second level menu for selection 'A' gives options for selection of:

- 1) Color Numbers — this game requires you to press the numbers keys. As each key is pressed it appears on the screen, in an enlarged form, and each number may be a different color. The object is to press each number until all the numbers are the same color. When this is accomplished, a computer-like figure appears and dances down the screen erasing the numbers as he goes. You then have the options of replaying that game, going to memory shaping, or returning to the primary menu.
- 2) Memory Shape — This displays eight figures of varying colors and locations with one matching shape displayed at the bottom of the screen for a brief viewing. The idea is to select the appropriate shape by typing the corresponding number. If you need to take another peek, you may press the space bar. My little ones found that this was not required often.

From the primary menu, using selection 'B' you get to select from:

- 1) Color House — an interesting game which has a

COLORFORTH™ FORTH COMPILER

THERE IS LIFE AFTER BASIC! COLORFORTH is a figFORTH language compiler designed for use on the Color Computer. COLORFORTH Version 2.0 is available now with all these features and more:

Can access ALL available RAM from 16K through 64K and will work with any current ROM

Executes 10 to 25 times faster than BASIC and can be programmed much faster

50 additional commands are included beside the standard figFORTH commands

You get BOTH cassette and RS/DOS versions, PLUS a resident figEDITOR, and an 82 page manual

A special command that allows you to copy your program so that it can be run on a CoCo without

first loading COLORFORTH

ALL OF THE ABOVE FOR ONLY..... \$49.95

DECISION MAKER™

IF YOU HAVE EVER HAD TROUBLE MAKING UP YOUR MIND, THEN THIS PROGRAM IS FOR YOU!

DECISION MAKER is a new concept in programs for the Color Computer.

DECISION MAKER is ...

- * A step by step, interactive program to help you solve any problem
- * Designed using standard analytic techniques
- * A learning tool to discover the exact processes used in reaching a decision
- * A valuable asset for anyone

DECISION MAKER requires 32K and Ext. Basic Complete with 16 page manual, only..... \$24.95



BIO-PSYCHOMETER™

NOW YOU CAN INVESTIGATE THE HIDDEN REALMS OF THE HUMAN MIND!

BIO-PSYCHOMETER is an authentic Bio-feedback device complete with software

BIO-PSYCHOMETER includes:

- * Bio-feedback graphing, Stress Reduction, and Memory Improvement modes
- * Machine Language, high speed graphics
- * Very sensitive hardware for optimum results
- * Printed manual with instructions and suggestions for use

BIO-PSYCHOMETER requires 32K and Ext. Basic Complete, with manual, only..... \$39.95

We accept U.S. funds drawn on U.S. banks, VISA & MASTER CARD, & UPS C.O.D.s
Add \$2.50 shipping & handling
Texas residents add 5%

ARMADILLO INT'L SOFTWARE

P.O. BOX 9351

AUSTIN, TEXAS 78766



PHONE (512)835-1088

'worm-like' figure crawling across the screen to a colored house. When he arrives at the front door he will ring the bell. If the house is the same color, the worm will be allowed to enter and a solid colored block will appear at the top of the screen to show you how many houses have been entered. To change the color of the house you must press the space bar. I found that this took some practice to get the correct timing down pat. After all eight colors have been scored, you may return to the menu or replay the same game.

2) Alphabet Shapes — requires that you match the shapes of lowercase letters. A letter is displayed in a box and by pressing the space bar you proceed from 'A to Z', stopping when the letters match, to type the number '1' to tell the program that you think the shapes match. If you are correct, the letters are displayed with the 'alphabet song'. Again, you have the option to replay or get the primary menu.

Selecting option '3' from the primary menu allows access to:

- 1) Which Is Different — this game allows for selecting the one shape of four that does not match the others. The selection is made by entering a corresponding number and correct selections are scored at the bottom of the screen.
- 2) Counting Blocks — this game allows you to draw a surprise picture by counting the number of blocks displayed. Entering the correct number adds another section of the picture, which is displayed as each correct selection is made.

First Games is a first-class educational game package. It is directed at pre-school children and should meet their requirements quite nicely. I commend the author and distributors for making these kinds of quality educational packages available.

(Computer Island, 227 Hampton Green, Staten Island, NY 10312, 32K ECB, tape \$24.95, disk \$27.95)

— Tony Compton

DEFT Bench and DEFT PASCAL: Improved Software Workbench

The January 1984 issue of *THE RAINBOW* carried a review, which I wrote about the *Colour Software Workbench*. That review version was 2.0. Since then the package has undergone a few changes and some rather interesting additions. The subject of this review is those changes and additions and their effect on the package as a whole. Before I begin, there is one item that needs to be mentioned. The name of the package has been changed from *Colour Software Workbench* to *DEFT Bench* and *DEFT PASCAL*. The folks at DEFT Systems, Inc. have unbundled their software such that you are not required to purchase the entire package if you do not desire to do so. See their ad in any of the latest *RAINBOW* magazines for particulars.

In the January review, I stated that I felt the programs and documentation were of excellent professional quality. Well, nothing has changed to alter that opinion. Indeed, the following additions only further enhance an already excellent package. The thought and skill that went into these additions, I think, are outstanding. The DEFT Systems people have put together a package which is a complete PASCAL and/or assembly programming environment that is reasonably priced and works like a champ.

First, let's look at just what changes have been made. The original 2.0 version lacked a floating point arithmetic package. What that, in essence, meant was that the PASCAL compiler, like many of the compilers on the market, could only handle whole or integer numbers.


Version 3.1 of *DEFT PASCAL* has floating point arithmetic added. The range, although not stated in the manual,

* LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES *

*** SOFTWARE ***

Bertamax, Inc. (Educational)
Computerware (All)
Custom Software (No Disc.)
Frank Hogg Labs (OS-9 & Flex)
Key Color Software (Key 264K)
Tom Mix (All)
Petrocci Freelance (All)
Platinum Software (!)
Soft law (VIP & Colorquest)
Speech Systems (All)
Sugar Software & (Super)
Moreton Bay (More)
and Much More.

We are a discount house—Call.



*** E.D.C. INDUSTRIES ***

Software • Hardware • Support
Educational • Small Business • Games

VOICE (213) 258-6593 10 A.M.-10 P.M.
BBS (213) 258-0640 24 HRS.
300 and 1200 Baud

6130 YORK BOULEVARD
(Near North Figueroa St.)

POST OFFICE BOX 42718
LOS ANGELES, CA. 90050

*** NOVEMBER SPECIALS ***

Amdk Dble. Drives... ..\$435.00
Hayes 300 Smart.....\$225.00
VIP Writer+ or Calc.....\$ 55.95
Graphicom.....\$ 24.95
ROM Y-Cables.....\$ 26.95
Star Trader.....\$19.95/\$22.49

See us for:

PBH	Elephant
Hayes	Gemini
Interfaces	Controllers
Speech	Music

**ALWAYS MORE AND BETTER
CALL US LAST!**

* LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES * LOCAL * IN * LOS * ANGELES *

appears from the tests run to be $1.0E+64$ to $1.0E-64$. That is significant for an eight-bit implementation. The addition of the floating point package added the following functions: ARCTAN, COS, EXP, LN, MARK, NEW, RELEASE, SIN, SIZEOF, SQR, and SQRT.

Of the above listed set, the following are not directly related to the math package, but instead provide more versatility to the compiler. The MARK, NEW and RELEASE functions deal with allocating and deallocating heap and can be very helpful in building linked lists in memory. In order to implement these functions, it is necessary to also support pointers, which this package now does. The SIZEOF function will give you the size in bytes of any variable. This function is of importance when dealing with string variables. The ARCTAN, COS, EXP, LN, SIN, SQR and SQRT are the standard math functions found in all compilers.

Along with the floating point package comes a library program which will allow you to build your own library files. The previous version of DEFT Bench and DEFT PASCAL allowed you to build modules and interfaces, which could then be linked into your program. However, there was one drawback to that scheme. Each module had to be in a file by itself and had to be specifically mentioned at link edit time.

The new version of the "LINKER" has provided the option of building a library of modules on a single file. Then at link edit time, only those modules referenced in the program or subsequent procedures will be pulled from the library file and linked to the program. The number of library files that can be used during any one link edit run is 50.

A new program has been added to the DEFT system disk called "LIB." This program will manage the library files for

you, giving you the ability to add and delete modules from any given library file. This is an excellent addition to the already excellent product. The library concept can make life ever so much easier. Just imagine not having to recompile a graphic or sort routine every time. Simply place it in the library in compiled form and pull it in at link edit time. All one has to do is declare the procedure to be external and reference it as will in the program. The addition of the library concept will slow down the link edit process, but not enough to be noticeable.

DEFT Bench and DEFT PASCAL also now support the 64K CoCo. What that means is that if you have a 64K CoCo, all the DEFT programs will use the entire 64K of memory. The BASIC and Disk ROMs are totally disabled and not used. Thus, when you run your programs, you have the full capabilities of the machine at your disposal. Also, you do not have to be bothered by the already known problems with some of the BASIC math routines and the problems associated with Disk BASIC. It is really nice to see the text editor come up with a buffer space of over 42K bytes.

Along with all of that, the manuals have been completely rewritten and printed in a new format. They are now spiral bound, printed on glossy stiff paper and have a size of $5\frac{1}{2}$ by $8\frac{1}{2}$ inches. They are nice sized and will lay flat on any surface.

DEFT Bench and DEFT PASCAL remain an excellent example of what can be accomplished in the CoCo world. The entire package gives you all the necessary tools to learn PASCAL. If you already know PASCAL, then it gives you a total development environment. Nothing is missing, there is nothing else to buy. DEFT Bench and DEFT PASCAL consist of the following items:

- 1) PASCAL Compiler
- 2) 6809 Macro Assembler
- 3) Link Editor
- 4) Symbolic Debugger
- 5) Library Manager
- 6) Text Editor
- 7) Text Formatter

Also, while I am on the subject of learning, there is something I would like to mention. The College Entrance Examination Board has chosen PASCAL as the programming language underlying its Advanced Placement Computer Science examination in computer science. The importance of this decision is considerable. Any college applicant attempting to obtain advanced credit will be required to know PASCAL in order to complete the exam. DEFT Bench and DEFT PASCAL provide an excellent learning environment. The entire package is impressive. It is very well-written and extremely easy to use. In all the years I have been looking at software packages, never have I seen so much offered for so little. I have been doing reviews for THE RAINBOW for almost two years now and this has to be one of the finest packages I have seen to date. As I stated in my first review, "I am totally impressed with the professional quality of the programs and documentation." They are excellent.

(DEFT Systems, Inc., P.O. Box 359, Suite 4, Damascus Centre, Damascus, MD 20872; DEFT PASCAL \$79.95; DEFT Doc \$39.95; DEFT Bench \$49.95; Complete Package \$119.95)

— Frank J. Esser



PARENTS! GET A KID HOOKED ON COMPUTERS

Send for our unique **LOGO STARTER** program. Use it with your 16K Color Computer and Color LOGO from Radio Shack (Cat. No. 26-2722).

Teachers agree: LOGO is the best way to introduce children to computers. Now, with **LOGO STARTER** you won't have to read a book or instruction manual. Just load the **LOGO STARTER** tape.

Your child will draw exciting designs right from the start. You won't waste your time on a lot of tedious typing. And your child will be on the way to computer literacy.

\$13.95

SPEED READING

Busy executives! Students! Increase your reading speed dramatically.

Best available speed reading program for the CoCo. Reading material appears on the TV screen at the speed you select, training you to read faster. You can even change the speed while reading.

Complete with 6 different text selections. Plus a drill to improve visual span and perception.

\$17.95

WILD PARTY

A naughty, sexy computer game for 2 to 6 couples. RAINBOW: "Would definitely liven up most parties." (Oct. 83)

Write us; we'll send you a copy of the review.

\$27.95

All programs on cassette tape for 16K Color Computer. Ext'd BASIC not required. Prices include postage (PA resld. add 6%). Send check to Dept. R, P.O. Box 210, Jenkintown, PA 19046.

b & b software



Creating Bar And Pie Charts With *The Zapper Family*

What would you expect a program titled *The Zapper Family* to do? Most likely it would be an arcade game with mutant aliens attacking the peaceful citizens of Pleasantville and your mission would be to zap these enemies of humanity and save Earth from the electronic invasions. Not this time! This is usable, business-oriented software for the CoCo.

The Zapper Family is a group of high resolution graph-generating programs which allow the Extended BASIC 32 or 64K CoCo to create line, bar or pie charts on the screen and print them using a screen print program and dot-matrix printer. The graph generating programs included in *The Zapper Family* are the graph zapper, which creates line graphics; the bar zapper, which creates bar graphs; and the pie zapper, which creates pie charts.

Versions of all these individual programs have been previously reviewed in *THE RAINBOW*: *Graph Zapper* in the December '82 issue, *Bar Zapper* in the April '83 issue, and *Pie Zapper* in the October '83 issue. You may wish to dig into your archives to get the full scoop on the graph-generating programs. Each feature uses a series of menus and screens to allow the user to input, edit, and review the data which then generates the graph. The data then can be saved onto either tape or disk for retrieval or modification later.

The Zapper Family includes updated versions of the three graphing programs. Changes are made primarily in the handling of the graphics of the title area for better readability, and in the handling of the programs with multiple drives.

My office computer is a Mega-K IBM PC. While it is very nice for word and data processing because of its memory and monitor, I use my trusty 80C home computer and the appropriate *Zapper* program to create my graphs. The cost of upgrading the IBM to high resolution color capabilities far exceeds the entire cost of my CoCo system. The IBM software costs more than a 64K CoCo.

A graph takes the jumble of numbers generated by the spreadsheet program and makes the information understandable. To borrow a phrase, "A graph turns a sea of data into data you can see."

I have been using a spreadsheet program to generate the data and then transfer this information to the graphing program. This is where the latest "zapper" in *The Zapper Family* is used.

The *Spreadsheet Zapper* doesn't generate a graph per se: It converts *Spectaculator* files to something that can be understood by the three *Graph Zapper* programs, eliminating the need for manually inputting the data.

First, you perform your calculations using *Spectaculator*, saving the results to tape or disk. Then run the *Spreadsheet Zapper* to select and convert the chosen file and graph your calculations using any of the three *Zapper* programs.

To accomplish this you need a 32K Extended BASIC

CoCo, a tape recorder or disk drive, and the ROM Pak or disk version of Tandy's *Spectaculator* program.

It is unique to find a high level business application program available on both tape and disk. It is immeasurably easier to use the *Zappers* on disk. After you first transfer the disk version of *Spectaculator* to *The Zapper Family* disk, all the *Zapper* programs and files are available to be chosen from a menu.

With tape, you are required to use the ROM Pak version of *Spectaculator* and change tapes often to save and load files and programs as required.

While the disk system is faster (and utilizes a more featured version of *Spectaculator*), it was considerate of Southern Software to develop a separate tape version for those who need high resolution graphing but can't afford a disk system.

I have both versions of *Spectaculator*, the ROM pack/tape version which were purchased before upgrading to disk. Both work well with the *Zappers*. I got out some of my old *Spectaculator* files and shortly was creating graphs using the data contained in them. Some of the results were startling.

One of the things I use *Spectaculator* for is tracking personal investments and net worth. The spreadsheet makes it easy to calculate return on investment and determine ahead of time the results of various possible alternative investments.

The surprises were in seeing the total net worth line rise and fall over the last few years. The numbers were always there, but it is very dramatic watching that line rise and plunge. No doubt about it, graphs have impact.

The Zapper Family can be purchased in increments to meet your needs (and pocketbook). Any or all of the *Graph Zappers* can be included with the *Spreadsheet Zapper* at initial purchase or added later. *Spectaculator* has to be purchased separately from Radio Shack.

As typical with Southern Software Systems user guides, the documentation (21 pages) for the *Spreadsheet Zapper* is superb, allowing competent operation by a user having no prior experience. The pitfalls of possible entry errors are pointed out, and helpful hints abound.

The Zapper Family is an exceptional group of programs for the Color Computer. For business and serious home applications, the value of generating high resolution graphs far exceeds the reasonable prices of the programs.

The limitations of *The Zapper Family* are not found in the Southern Software zapper programs, but in the Radio Shack *Spectaculator* spreadsheet program.

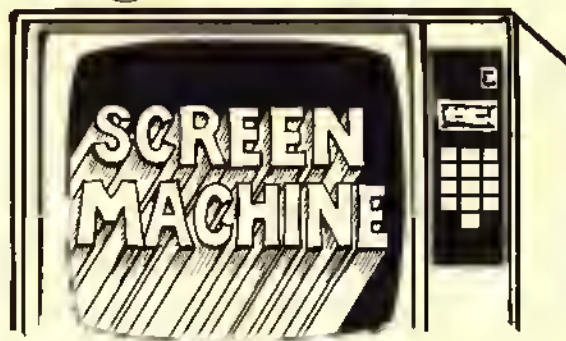
In summary, if you are pleased with *Spectaculator*, you will love the *Spreadsheet Zapper* and the rest of *The Zapper Family*. The good news is that the remainder of the *Graph Zapper* programs will work without the *Spreadsheet Zapper* and are available separately.

(Southern Software Systems, 485 South Tropical Trail, Suite 109, Merritt Island, FL 32952. *Spreadsheet Zapper*, tape \$17.95, disk \$25.95. *The Zapper Family* complete, tape \$59.95, disk \$79.95)

— Bruce Rothermel

Sugar
Software

Sugar Software



RAINBOW SCREEN MACHINE

SUPER SCREEN MACHINE

- The Rolls Royce of graphics/text screen enhancers — more screen features than all others combined!

- Add these features to your computer/program: ML extension of Basic loads on top of 16, 32, or 64K machines to enable easy mixture of hi-res graphics and text in your programs. Dense text or large lettering for children, visually impaired or VCR title screens with no programming!

- User definable 224 character set featuring lower case descenders, Greek, cars, tank, planes, etc., completely interfaced with all keys, commands, and PMODES. 12 sizes (most colored) from 16 x 8 to 64 x 24. PRINT @, TAB and comma fields are fully supported.

- 2 distinct character sets automatically switch for sharpest lettering featuring underline, subscript, superscript, reverse video, top and bottom scroll protect, double width, colored characters in PMODE 4, and help screen.

- Simple 2-letter abbreviated commands inside your program or control key entry from keyboard, even during program execution!

- Includes demo program, character generator program and manual. 16K Ext. Basic required — 32K recommended. **\$29.95 Tape; \$32.95 Disk.**

Screen Machine can be used in games, word processors, utilities, etc. In addition, the custom graphics characters can be used to develop easy, effective hi-res character-graphics programs. The potential is truly unlimited.

Screen Machine can be used to directly create video recorder title screens or large lettering for children or the visually impaired simply by typing.

- Revolutionary — heralded as the most useful, powerful and versatile state-of-the-art utility ever developed for the Color Computer!

- All of the features of Screen Machine and more:

- Variable **SMOOTH Scroll** for professional displays, listings, business use.

- Variable volume **KEY Click** (tactile feedback).

- **EDTASM + command** for instant compatibility with cartridge EDTASM

- **Superpatch + command** for instant compatibility with the Superpatch + Editor-assembler

- True **Break key** disable and recognition.

- 10 User Definable commands used to activate your special drivers or subroutine.

- Dynamic **Screen Dump command** for use with Custom Software Engineering's Graphic Screen Print program for simple printer "Snapshots" of your screen even during program execution!

- The new standard — Upgradeable at any time from previous Rainbow-Writer or Screen Machine purchase. Return old program, manual, plus cost difference and \$7.00 shipping and handling.

- Super Screen Machine **\$44.95 Tape; \$47.95 Disk.**

Screen Machine is fully interfaced with all keys and commands. Although some Basic programming knowledge is recommended just a few minutes spent studying and referencing your computer's Basic manuals will turn you on to the power of computing with Screen Machine.

Sugar Software

Gift Certificate

Pay to the order of _____ available in _____
 Amount: _____ any amount!
 Name: _____

A complete catalog of other sweet Sugar Software products is available.

SUGAR SOFTWARE
 2153 Leah Lane
 Reynoldsburg, Ohio 43068
 (614) 861-0565
No refunds or exchanges.



Add \$1.00 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405, 1374 Dealer inquiries invited

Music Library 100 — A Notable Program To Make CoCo Sing

One of my most treasured possessions is a 1946 Wurlitzer 1015 Jukebox. If you've seen the TV program "Cheers," you've seen this magnificent music machine with its colored pilasters and bubble tubes running up both sides of the apparatus.

I now have another jukebox. While it is contained in a small mild-appearing gray case, rather than in a wood and chrome structure, it sure does create some pretty tunes. This new jukebox is my trusty ol' CoCo equipped with the *Music Library 100* program from Speech Systems.

Music Library 100 is a series of musical songs created using Speech Systems *Musica* and *Musica-2* programs. The *Music Library 100* lets you play the songs created by the author (musician?). You cannot create your own tunes or modify the existing songs without obtaining the *Musica* program.

When the programs are run, a menu showing the available selections is displayed. You then have the option, just like my Wurlitzer, of playing any available selection and it doesn't cost a nickel a tune. If desired you can play multiple selections by selecting the numbers of the songs. The selections are then automatically loaded and played.

Wandering from the main topic of the review, the similarity between a 45 rpm record and a 5¼-inch floppy disk is amazing. They're both about the same size, have a hole in the center and spin when they are played, and of course audio and digital cassette tapes look identical.

For those of you who are familiar with the sounds created by using the *PLAY* and *SOUND* commands, you are in for quite a pleasant surprise when you hear the sounds created by *Music Library 100*. Instead of a single note being played at a time, up to four notes or tones can be played simultaneously. The results are similar to the sounds created by a Moog synthesizer. At first I was disappointed by the quality of the sound generated through the speaker of the TV I am using as a monitor. There was no bass, and if I turned the volume up loud, the speaker distorted the music so much that it turned into annoying fuzz.

The solution was to plug an external speaker into the external speaker jack. What a difference! The full tonal range that the composer had in mind could be heard. Speech Systems also sells a Stereo Pak which plugs into your ROM port to direct the music to your stereo system.

Whether or not you will be enthralled with *Music Library 100* will depend on your musical tastes. A wide selection of music is included:

- music from stage, screen and TV (11 selections, 17 minutes)
- music of the '70s (10 selections, 20 minutes)
- music of the '60s (11 selections, 18 minutes)
- music of the '50s (11 selections, 18 minutes)

- old time favorites (13 selections, 15 minutes)
- classical (6 selections, 14 minutes)
- Christmas music, popular (11 selections, 17 minutes)
- Christmas music, traditional (11 selections, 15 minutes)
- patriotic (11 selections, 15 minutes)
- polka party (10 selections, 17 minutes)

Each song can last up to about 3.5 minutes.

After listening to the selections, I was curious as to how the CoCo could create these melodies. Speech Systems' explanation is:

Musica-2 generates a stream of numbers that the Color Computer converts to voltages through the sound port (6-bit digital to analog converter). By varying the numbers and thus the voltages at the appropriate rate, a tone is produced through the TV speaker. The rate at which the numbers are sent to the sound port is fixed at about 8,000 numbers per second. Pitch is varied by skipping a certain number of values in the tone table. Thus, a tone that is generated by skipping every other number is an octave higher than one that utilizes every number. This method of varying pitch makes it possible to produce more than one note at once, each independent of each other.

If you understand this, great, because I don't. I'll just enjoy the music and think of it as being more CoCo magic. Actually, I want to further investigate the possibilities of creating some music of my own now that I've heard what the Color Computer can do. With *Music Library 100*, Speech Systems has created a neat little hook to sell a lot of *Musica-2* programs.

It is available in both tape and disk versions. However, the disk release is much more usable as it allows instant random access to any of the selections contained on the disk.

If you have a 32K Extended BASIC CoCo and an urge to hear what beautiful music your computer can make, you might want to check into *Music Library 100*.

(Speech Systems, 38W255 Deerpath Rd., Batavia, IL 60510, tape \$34.95, disk \$39.95)

— Bruce Rothermel

One-Liner Contest Winner . . .

Here's a one-liner which produces pretty patterns of lace in any size you'd like. Just type and *RUN*, choose the desired lace size (1-9), and see the colorful pattern.

The listing:

```
Ø CLS(Ø):PRINT@235,"***LACE***";
:PLAY"FDGD":FORA=1TO1000:NEXTA:CLS:
INPUT"TYPE IN SIZE OF A LACE(1-9)";B=B+3:IFB<40RB>11THENØEL
SEC=RND(3)+1:Pmode3,1:PCLS:SCREE
N1,Ø:FORD=1ØTO242STEPB:FORE=1ØTO
178STEPB:CIRCLE(D,E),B,C:NEXTE,D
:F0RF=1TO3000:NEXTF:GOTOØ
```

John Printz
Sinking Spring, PA

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.)

K-BASIC: A Better System Environment

By Dale Puckett and
Bruce Warner

There are hundreds of compilers available for more than a hundred programming languages used on hundreds of computers sold these days. They all have their strengths and their weaknesses. Some languages are designed for precise scientific mathematics. Some are designed to be interactive with the programmer. Still others are designed to process massive files of records for financial institutions.

A financial institution has little practical desire or need for a compiler that will go to 64-decimal places of precision arithmetic, and a compiler designed for scientific notations has no practical need for the ability to sort sequential data files into alphabetical order in record time.

The Beginner's All-Purpose Symbolic Instruction Code (BASIC) was developed at Dartmouth College almost 20 years ago. Doctors John Kemeny and Thomas Kurtz could be considered the fathers of BASIC because they were the first to implement the language into a computer system (a General Electric 225).

Ease of use is the primary advantage of BASIC. A variety of BASICs has been introduced to help improve the

language, but most serious programmers still do not recommend its use in a professional programming environment. We both try not to recommend BASIC because it lends itself to the promotion of sloppy programming habits. On the other hand, BASIC is easily learned and it may be just right for your home programming needs.

K-BASIC is an Extended, not Extended Color, graphics compiler for the CoCo that has several additional features, making it easy to use structured programming and help you stop complaining that BASIC is a non-structured language. Twelve-character variable names help you write self-documenting code, reducing the need for page after page of comments. A variable name like "PCent Rate" is much easier to figure out than "P".

There are a variety of compilers running on the Color Computer, so it shouldn't be a surprise that they resemble Radio Shack's Disk Extended BASIC. K-BASIC is one of the closest we've seen to date.

Reading the manual, you'll find that you could almost key in your Radio Shack BASIC programs and run them under FLEX or OS-9 using K-BASIC. Both the commands and the format are similar. There are a few limitations which we'll get to later. But there are some enhancements to Radio Shack BASIC as well.

K-BASIC proves, more than anything, that every purchase for your Color Computer is a trade off. When you decided to go to one of the true operating systems (like FLEX or OS-9), you decided to trade off the perfectly good (not great) Radio Shack DOS for something that offers more flexibility (not to mention more data storage, additional applications capabilities and a whole new world of serious business software). You also had to make the deci-

Sonburst Software

233 S.E. ROGUE RIVER HWY.
GRANTS PASS, OR 97527 1-503-476-5977

The very best utilities for the 64K Disk Color
• Computer, featuring ...

- Full use of 64K RAM
- Parameters ...
- NOW — All programs RSDOS or JDOS compatible!
- 35 or 40 track, single or double sided drives!
- Se ... drive sleeping role • Supports 1-4 drives

1. **EDT and MAS** — At last! Here's the best editor/assembler package you can buy. More solid working tools included for the software craftsman than ever before to make your job easy — even fun! And no more time and memory wasting ROM calls — you get a full 49,152 (\$C000) bytes of high res text space to work with in EDT and 16K of program assembly room in MAS means supersonic disk access that doesn't give you time to read War and Peace while you're waiting for an assembly to finish. Block commands, space saving disk file commands, roomy 21 gron text files, macros, conditional assembly, include files and much more yet! — only **\$74.95**
EDT still available alone at **\$39.95**
2. **The Sector Inspector** — "VERY user friendly" — the Rainbow (Aug '84), 212 sectors in memory! Still the best **\$29.95**
3. **The Deputy Inspector** — unique and still only **\$21.95**
4. **The Archivist** — tape backup of your disks **\$14.95**
5. **The Chief Inspector** — SAVE! All 3 disk utilities **\$59.95**

• Please add \$1.50 for shipping, \$2.50 for C.O.D. •

6809 SYSTEM DEVELOPMENT



EXPANSION HARDWARE FOR THE TRS-80 COLOR COMPUTER

XPNDR1™

CoCo Expander Card

Gold edge connector plugs into the CoCo cartridge connector. Signals are labeled on the bottom (wire side) with ground and power buses; plated through holes. The 4.3 x 6.2 inch glass/epoxy card is drilled for ICs and components. The finest bare breadboard for your CoCo. Includes 8 page *Application Notes* to help you get started.

\$19.95 each or 2 for \$36

SuperGuide™

Precision molded plastic insert designed specifically to align and support printed circuit cards in the CoCo cartridge slot; an unbreakable removable card guide. Patent Pending.

\$3.95 each

Available now from:

ROBOTIC MICROSYSTEMS

BOX 30807 SEATTLE, WA 98103

sion to invest in new programming languages, and to learn more about your CoCo.

There are those that feel OS-9 and FLEX are too advanced for a small computer, but as someone said at a computer meeting a few weeks ago, "Most people like to stay with Radio Shack's DOS because it gives them an excuse to remain ignorant." Going to OS-9 or FLEX will necessitate that you learn something about computer systems, in exchange, you will learn more about the actual operation of your Color Computer, and computer systems in general, than you ever thought you'd even want to learn. That knowledge will pay off in increased productivity from a little game machine (isn't that what Radio Shack is still trying to convince us that it is) than some people can get out of their \$2000 systems.

K-BASIC is not cheap. It comes with a price tag right at \$199. IBM software starts at \$500. For \$199 you get the *K-BASIC* Compiler, a Run-Time Package and Lloyd I/O's OSM Extended Macro Assembler. We've been told by Lloyd I/O that you can purchase *K-BASIC* without the OSM assembler for \$125, but if you don't already have a good assembler for OS-9 or FLEX, you'll want OSM for the added \$74 (OSM costs \$99 on its own).

Graphics commands are missing entirely from *K-BASIC*. It is not meant for the development of charts or games. It is designed for more serious uses, including 15-digit real numbers or up to 64-bit double long word integer numbers. That gives you whole numbers from -36,028,797,018,963,968 to +36,028,797,018,963,967. It's hard to imagine needing that large a number for any of your home financing programs on a home computer, but scientists may be interested in really *big* numbers.

Real numbers are stored and manipulated (or processed) in BCD (binary coded decimal) format, and require a slightly longer time to compute once compiled. Their advantage is the precision they offer; the execution time is a small price to pay if you're interested in being exact.

Integer numbers are stored in their binary format and take less time to compute. If your decimal places aren't important, you may want to use integer numbers for greater speed; this could help cure the time complaints about BCD arithmetic.

Lloyd I/O's *K-BASIC* for the OS-9 version uses nothing but BCD arithmetic, but is being modified to use binary math for integer numbers. That should resolve rumored complaints about the OS-9 version's slow execution time of compiled programs under OS-9. The trade off this time—saving time will add to the probability of errors when computing large numbers.

There are six major types of variables with six subdivisions for each and three sub-types each. The major types are: real numbers; character strings; signed eight-bit byte integers; signed 16-bit word integers; 32-bit long word integers; and signed 64-bit double long integers. The added sub-types are non-subscripted, single-dimensioned and double-dimensioned arrays. Variable names are from one to 12 characters long and all 12 characters are significant. The variable names can be in both upper- and lowercase (all are read as uppercase only when compiled), and numbers are allowed within the name (provided they are not the first character). It would almost take 64-bit arithmetic to figure out all of the possible variable names, so let's just say you can get very specific with naming your variables and not have to worry about remembering what you labeled a specific variable when you want to change the program a year from now.

Dimensioning of arrays is done in the standard BASIC format. The variables can be subscripted with other variable names during the actual program, but not in the *dimensioning* statement.

There is no *PRINT USING* statement, so you will have to develop a series of routines to develop your own printer formatting. Experienced BASIC programmers will not find that a problem, but beginners should be warned. Those older CoCo owners will remember not having Extended Color BASIC and be glad this is about the only place they have to revert to plain old Color BASIC.

Line numbers are optional. You can use line numbers for labels or the optional routine names (up to 16 characters long) for the label. If the first space of a line contains any character other than an asterisk, the word (or number) up to the first space is considered to be a label. If the first character is an asterisk, the line is thought to be a comment (typical of many compiler languages), and if the first character is a space, the first non-space character will be considered to be part of an executable statement. The exception to the above is when the first non-label, non-space character is part of the word *REM*, in which case the line will be considered to be a remark (the same as the asterisk).

It may be worth noting that Lloyd I/O assumes you already know something about programming and programming environments when you begin reading their manual. It is written in such a way that you simply apply the appropriate commands to your own program in order to make it run. The standard conventions for defining your dimensioned arrays apply, and all variable names (up to 12 characters long) follow the same rules. Each of the six variable types is differentiated in that they each have a

Canadians!

Kelly Software Distributors Ltd. is Canada's oldest and largest supplier of color computer software. Serving the Canadian market, we offer state of the art games as well as a full range of business software; including spreadsheet, database and graphics programs. Dealer enquiries are welcome, so call or write today for our free newsletter and catalogue.

Kelly Software Distributors Ltd.

P.O. Box 11932

Edmonton, Alta. T5J-3L1

(403) 421-8003



different last character (type suffix). Real numbers and string variables are terminated in the same manner as in Microsoft BASIC (no suffix for real numbers and a dollar sign for string variables).

The prescribed characters available through *K-BASIC* are ASCII (American Standard Code for Information Interchange) characters \$20 (or 32 in decimal — a space) through \$7F (125 decimal — a tilde). Other ASCII characters that may be required for printer output or the like will require the use of the *CHR\$* function.

Dimensioning is limited to two-dimension arrays, but the actual number of arrays seems to be limited only by memory restrictions.

Five mathematical operators are available (add, subtract, multiply, divide and exponentiation). Their order of execution follows the same format as Color BASIC (working from the inner most parenthesis out, exponential powers, multiplication, division, addition, subtraction, left to right in the event of a tie). This is one area in which the compiler has given you more than your money's worth. (Crunch COBOL compiler under FLEX requires each mathematical operation to be written in a single sentence [the equivalent of BASIC's program line]).

Another area completely implemented in *K-BASIC* is the gate logic operators, including the *COM* and *EOR* commands. Now if I want to say *IF IS = "BRUCE" OR YOU\$ = "DENISE" GOSUB PART-OF-FAMILY*, I don't have to add *IF IS = "BRUCE" AND YOU\$ = "DENISE" GOSUB ALL-OF-FAMILY* to the beginning of the *PART-OF-FAMILY* routine.

With all of these nice words about *K-BASIC*, you should be wondering why *K-BASIC* is a trade off as we said in the beginning of this review. Here comes the bad stuff!

K-BASIC has a few serious drawbacks because you have to write a number of routines to use a formatted output. To confuse matters even more, you must open a sequential file in order to output to the printer, then you must print to the printer buffer (buffer 0). This is not uncommon for higher level languages (or the Commodore 64), but those of you only accustomed to Radio Shack BASIC will find this annoying.

Compiling time is slow, but worth the wait when you start running your compiled programs in place of interpretive BASIC. If there is a reason for the thinking *K-BASIC* programs execute slowly, it is the BCD arithmetic, a small price to pay if you're interested in a high level of accuracy.

We found the people at Lloyd 1/0 to be very helpful when called for help on how we should attempt certain routines with *K-BASIC*. This is worth noting in that they helped *before* they found out we were reviewing *K-BASIC* for THE RAINBOW. They do, however, prefer you write for assistance.

The manual has been modified since its preliminary release. The newer manual is said to have a complete alphabetical index in the back. Looking for a specific command is much easier to find in alphabetical order than in command type order, and that thought has been added to the newer manual.

Once compiled, the program is completely self-contained. This is worth noting in that a program you may want to market does not require the accompanying run-time module to be sold (and hence royalties paid) for its inclusion in the package.

Compiling time is long. It is estimated a great amount of the compiler time is due to disk access. All of the assembly

source code for your program is contained on the disk, and copied to another segment of the disk to be later compiled by your assembler. The OSM (or Frank Hogg's ASM) assembler also reads from the disk and requires a long time to compile.

If you are running standard Radio Shack disk drives, and have been content with them till now, your naive satisfaction is about to come to a disturbing halt. We were absolutely estate to have MPI 40 track, double-sided, double-density drives (2) on the CoCo used to review *K-BASIC* when we discovered the size of *K-BASIC*. With *SDISK* under OS-9 and using FLEX's setup command, we had full access to both sides, and all 40 tracks of each side. Our program disk contained both the *K-BASIC* compiler (along with all its run-time package) and a Crunch COBOL compiler, along with the entire FLEX operating system and a complete line editor.

With Radio Shack drives, you will need to change your disk four times. *K-BASIC* comes on two diskettes and the OSM assembler requires another 35-track disk. The editor will not fit on the compiler disk. Even if you only need three disks to store all of your compiler programs, you will need to change from the editor to the compiler to the run-time disk to the assembler, and require a second drive to store all of the compiler files. With all our years of experience on the Color Computer, we found it more than a little annoying swapping disks that many times (not to mention very confusing). Once you're used to it, it's something you can live with if you have to, but not something you want to put up with for very long. Recommendation? Make at least one of your drives a double-sided drive, and add *SDISK* to an OS-9 system. Since OS-9 is looking to become *the* operating system for the CoCo, we'd recommend the double-sided drives anyway (they cost a lot less than two single-sided drives and hold a lot more data!).

Another concern is that *K-BASIC* requires you to have an advanced Assembler (\$100 or more if you don't already own one). That's about twice what you'll pay for BASIC09 or C from Radio Shack. Soon Radio Shack will be coming out with PASCAL as well, at a similar price which will add to the perceived high price tag of *K-BASIC*.

On the other hand, *K-BASIC* is neither packed down nor interpreted. Once you have your compiled program, you are finished with run-time package, and your program can be executed directly as its own command module.

Just as a side note, if you're interested in learning a few assembly language routines, we'd recommend keying in some very short programs and compiling them into their assembly language file to learn more about assembly routines. If you attempt this, remember that the routines you are looking at are only one of dozens of possible ways to perform a task. Although they may be correct for one function, they may prove useless for another operation.

If you aren't interested in learning another programming language, but are interested in programming your 64K CoCo under FLEX or OS-9, we'd recommend *K-BASIC* for you. It offers you the most common commands of Radio Shack BASIC with faster execution time, in a better systems environment.

(Lloyd 1/0, 19535 NE Glisan Street, Portland, OR 97230, \$199)

Quizspin — An Appealing Game For Adults And Children

If your family is among the millions that watch TV's "The Joker's Wild" after dinner each evening, you probably will be attracted to *Quizspin*, a new release from Spectral Associates.

The familiar three picture windows are here, one-eyed handit style, and contain different graphic symbols. The number of matches within the windows helps determine the amount of earnings if you correctly answer the next question.

When the player presses any key, the categories spin within the boxes. The categories, along with the value, are presented. One picture is worth \$50, two are \$100, and three are worth \$200.

The real attraction to *Quizspin* for parents is its adaptation of the TV game for educational purposes. The categories are:

Presidents — Asks for the chief executive of the United States and the order in which he served (first, second, third, etc.).

States & Capitals — Asks for the capital of a state, or which state a city is the capital of.

Chemistry — Asks chemical name of various symbols, or the symbol for chemical.

Math — Addition, subtraction, multiplication or division problems.

In place of the devil, there is a mystery category that selects any of the topics listed above.

The game requires 32K Extended BASIC and two players may compete in a game, with the option of playing to any amount between \$500 and \$9,000.

For the most part, I believe the program will appeal to youngsters in the elementary grades, especially when those topics parallel those subjects they are presently taking in school. The chemistry symbols will be useful to even high school students under similar circumstances.

I think the graphic appeal could be enhanced by doubling or tripling the size of the picture windows. They don't have much of an impact when they are only about an inch wide, as they appear in the current version of the game.

The game moves along at a fairly nice pace, and seems to have, for my nine-year-old son, the same kind of appeal that the TV version of "The Joker's Wild" has for many parents. The advantage for him, however, is that he is broadening his education.

Autoterm: A Multi-featured Terminal Program

It sometimes seems that every terminal program I come across for the CoCo has some great flaw. With the number of first-rate terminal packages available for other computers, it would seem as though there could be a really good one for the CoCo as well. PXE Computing's *Autoterm* comes close to that goal.

Although *Autoterm* is primarily a terminal, it has a number of features that make it almost a full-featured word processor as well. This combination has some advantages; you can, for example, dump a file from a remote system into the text buffer and then, after you get off the system, edit the file and print it out with margins and other formatting without leaving the program. I don't know of any other terminal program that is integrated in this way.

Autoterm has Hi-Res text displays with full upper- and lowercase characters; this can range up to 64 characters in width. *Autoterm*'s Hi-Res text capabilities even include 32 columns (great for CompuServe) and a 40-column display that matches what a lot of Apple-oriented bulletin boards put out. By contrast, the smallest Hi-Res text mode of some other programs, such as *Colorcom-E* and *VIP Terminal*, is 51 characters wide. The Hi-Res display is quite fast as well; it took a full 300 Baud transmission without noticeable delays (I did not try it at 1200 Baud).

Autoterm has its minor problems, though. The buffer stays open all the time; instead of opening the buffer at the beginning of a text file and closing it when the end is received, you position markers at the beginning and end of the portion you want to print or save on disk. If you have a big article or program to download, you may find that you don't have enough room because part of the buffer is wasted on the login sequence, system bulletins and other nonessentials. You can jump into the text editing mode, delete what you don't need and jump back before you start reading the file, but this is a bit clumsy. Another problem is that the program is protected by having a special hidden code on the disk that the program must find in order to work; one copy I had suffered some accidental damage, so I was down to a single disk. (The package comes with two copies of the program.)

All in all, *Autoterm* is one nice program — or is it two?

(PXE Computing, 11 Vicksburg Lane, Richardson, TX 75080, disk \$49.95 plus \$3 S/H)

(Spectral Associates, 3418 South 90th Street, Tacoma, WA 98409, tape \$19.95.)

— Charles Springer

— Ed Eilers

CoCo Dump

'Close To Perfection'

CoCo Dump is a highly advanced screen dump program for Epson printers (the MX series printers require Grafix Plus) and the Gemini 10X and 15X. The program has some advanced features that set it apart from the other screen dumps on the market.

CoCo Dump runs on a 16K Extended CoCo (it would probably work on a non-extended computer, but you wouldn't be doing Hi-Res graphics on it anyway). Both tape and disk versions are available. You can relocate the program wherever you like; to put it near the top of a 32K machine you might use *CLEAR 200,&H7CFF:CLOADM "COCODUMP",16384* to load it. To make the actual print-out, you would (after putting the printer on line) *EXEC &H3D00* for a 16K machine; the program asks you if you want normal or inverse printing and a large or small picture. With the press of two keys the process starts, and you come back to OK when it's finished.

The disk version has a nice addition in the form of a BASIC program that does screen dumps from disk files. When you use this, a directory of all binary files is shown and you use the up- and down-arrow keys to locate the one you want; pressing ENTER shows you the picture briefly, asks you if

you really want to dump that picture, and then goes into the dump routine itself.

The pictures themselves are only slightly rectangular, and have almost the same proportions as the CoCo's display. You can dump a picture in either the large 7 x 7½-inch size or the small 3½ x 3¾-inch size. The program even puts a border around the picture.

The print quality is as good as anybody has a right to expect from a CoCo screen dump. The picture, at last, has the proper proportions; circles that you painstakingly adjusted stay adjusted. Image size is good and none of the picture is cut off at the sides. This program is intended only for *PMODE 4* pictures, so *PMODE 3* graphics will not come out in gray scale and the red and blue artifact colors will become alternating black and white vertical lines.

CoCo Dump is as close to perfection as anything of its type I've seen. About the only thing I know of that gives better results is a \$400 Mitsubishi video printer — and even that has its quirks. If you have an Epson or Gemini printer, I don't think you can go wrong with this program.

(Spectrum Projects, Box 21272, Woodhaven, NY 11421 or Box 9866, San Jose, CA 95157-0866; tape or disk \$19.95 plus \$3 S/H)

— Ed Ellers

MUL-T-SCREEN



COLOR CHARACTER GENERATOR

A NEW DIMENSION IN COLOR COMPUTING



- Now includes a character generator and sample graphic space game at no extra cost.
- Full 224 text and graphic characters. Underline in all PMODEs. Print vertically.
- All machine language, user transparent. Supports all BASIC, EXTENDED BASIC and DISK commands.
- Automatic loader recognizes 16K, 32K & 64K computers.
- Mix up to 5 character sizes in 4 colors all on one screen. A total of 10 sizes available from 8x4 to 42x24 or 32x32 in vertical mode.
- Use up to 4 definable window screens of any size. Also includes horizontally scrolling (crawling) one line screens.
- Includes positive & negative screen dumps in 2 sizes for R/S, Epson & Gemini printers. (Please specify)
- Special Trace Delay can be used to debug programs one line at a time (even graphics).
- A special printer control can output characters to the screen & printer simultaneously.
- A must for all color computer owners. Once you try it you won't write another program without it.

INCENTIVE SOFTWARE

(519) 681-0133

P.O. BOX 323
STATION B
LONDON ONTARIO
CANADA N6A 4W1

P.O. BOX 7281
PORT HURON
MICHIGAN 48301
U.S.A.

MINIMUM REQUIREMENT 16K BASIC
TAPE - 24.95 US or 29.95 CDN
DISK - 27.95 US or 32.95 CDN



Tape to Disk upgrade available for \$8US or \$10CDN. We pay postage within US & CANADA on orders over \$20, otherwise please add \$1. Other countries please add \$2. Charge orders please add \$1.



BUT...CHECKERBOARDS ARE FOR TABLECLOTHS!

THE LOWERKIT III FROM GREEN MOUNTAIN MICRO

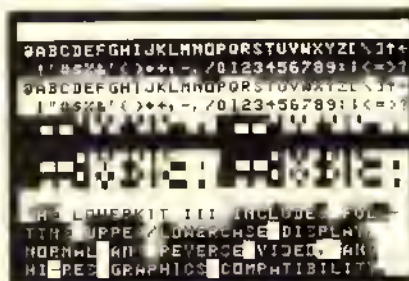
Still cloaking your Color Computer in a checkerboard tablecloth? Since 1981, thousands of Color Computer users have uncovered their computer by discovering the Lowerkit — the first and best full-time lowercase and special symbols generation system for your Color Computer.

Why a Lowerkit? Because uppercase-only display is a relic of the user-unfriendly past. And because you can't really read a checkerboard excuse for lowercase display. Sure, software lowercase comes with a handful of commercial programs. But software lowercase gobbles up over 6,000 bytes of your precious memory. Even if you have 64K, you'll give up 10% of it for a simple lowercase display. And software lowercase vanishes when you change programs or turn off your computer.

Take 15 minutes. Put the Lowerkit in. A Lowerkit is simple, reliable — and it's always there. You flip on your machine, and Lowerkit's bold lettering greets you.

No tapes, disks or cartridges to load first. No compatibility problems; when you don't want it, you switch it off.

And now, the new Lowerkit III includes a reverse screen switch as well. Big, bright green letters on a black background.



Original Color Computer Display



LOWERKIT III Display (reverse video, too)

Three years ago, the Lowerkit made history and set the standard in Color Computer lowercase. For example, game and education programs from Sugar Software have Lowerkit display options. Spectrosystems' ADOS supports the Lowerkit; so does Cer-Comp's TextPro. Cartridge Scriptsit looks beautiful with a Lowerkit. Spectrum Projects, Cheshire Cat and many others have developed beautiful alternate character sets which you can download from Micronet, burn into an EPROM, and snap into your Lowerkit.

Pull the checkerboard tablecloth off your Color Computer with a **Lowerkit**. The original. The standard.

Set New Standards with the New **Lowerkit III**

- Lowerkit III, assembled and tested, \$79.95
- Lowerkit III, complete kit of parts, \$49.95
- Lowerkit III, printed circuit board, \$20.00

Be sure to specify Color Computer or Color Computer 2.

ALSO AVAILABLE FROM GREEN MOUNTAIN MICRO

Color Burner with software, \$69.95 / \$56.95 kit

Micro Language Lab "Learning the 6809", \$99 (plus \$3.50 shipping and handling)

CoCoPort interface, \$49.95 / \$39.95 kit

RAM/ROM pack, \$29.95 / \$19.95 kit

64K Color memory upgrade kit, \$49.95 with NEW Memory Tester, \$54.95

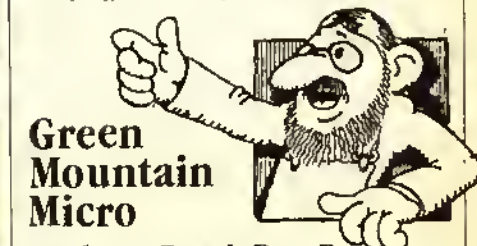
Color Quaver, Software Music Synthesizer, \$19.95

Scroll-A-Roll software video text display, \$24.95

TV Buff II*, Improved to handle virtually all monitors, \$14.95

(Add \$2.50 shipping and handling)

**Specify Color Computer or CoCo II*



Green Mountain Micro

Bathory Road, Box R
Roxbury, Vermont 05669
802 485-6112

Hours: 9am-5pm, Monday-Friday

COD/VISA/MASTERCARD

TRS-80 is a trademark of Tandy Corporation

Blast Those Mines With *Miner*

Miner is a machine language game written for the 16K CoCo with 1.0 or 1.1. BASTC. It is a one-player game with minimum action and animation. The game starts in the deep underground coal mine. The object of the game is to gather as much coal as possible before running out of dynamite. Points are given for each lump of coal you retrieve. Once your initial supply of dynamite runs out you are given more charges. The number of additional charges is based on your current score. Each time the screen is cleared of coal, you are awarded bonus charges.

The coal mine is actually a 14 x 16 grid. In this grid, 25 lumps of coal are randomly placed. You are also placed randomly in the grid. The rest of the grid is made up of stone which must be blasted. You move around (once you've blasted a tunnel) with the arrow keys. Pressing the space bar causes the dynamite to detonate.

The graphics are mediocre. The sound seems somewhat realistic. There are no bells and whistles.

The game is somewhat challenging in that you are required to place your dynamite charges strategically in order to get the maximum amount of coal using a minimum amount of dynamite. I would suggest *Miner* for the beginning game player. I think it would be an excellent game for a young child because it would teach him to use logic and familiarize him with the arrow keys. If you are an experienced game player or want a lot of animation and sounds, I don't think *Miner* is for you.

(The Dataman, P.O. Box 431, Station B, Hamilton, Ontario, Canada, L8L 7W2, \$14.95 Canadian, \$12.95 U.S.)

— Michael Hunt

Spell-N-Fix II Is A Quality Spelling Checker

Free software! I'm sure that if Star-Kits had a bigger "free" notice in their software ad they would be completely overwhelmed with mail requests. If you haven't noticed the ad, Star-Kits is distributing some of their software for the Color Computer in a rather unusual way. They call the method "Pass the Hat" software. They will send you the software for "free." If you like it, they would very much like you to send a contribution. Star-Kit will obviously take any amount, but would be most pleased to receive the normal retail price of the program. When you receive the program you are invited to give it to all your friends and acquaintances who can use it. You realize that this is essentially the same network responsible for the wide distribution of unauthorized copies of much software. They are hoping that the software is good enough to impress many eventual users to thank them with a check. The intent of this experimental distribution technique is to improve profitability which is being hurt significantly by pirating. This is one of the few options other than making the software more copy-proof. Software locking techniques are expensive as well as only partially effective. Besides, they are an irritant to honest customers who need backup copies of their software.

Spell-N-Fix II is one of the programs being offered by Star-Kits in this fashion. It is a recently revised version of the original spelling checker program available for the Color Computer. Before being offered as a Pass the Hat program, *Spell-N-Fix II* was advertised at \$69. Since this program is available with payment on approval, I will limit this review to a very brief overview so that you can decide if it is worth the postage to send for — an easy decision. Remember, Star-Kit wants you to send what you think the software is worth so, in essence, you will do your own personal review of this program in making that decision.

Spell-N-Fix II is designed for disk using RS-DOS. (Note: there are FLEX and StarDos versions of the original *Spell-*

MIND MASTER™

"ROOTS" GENEROLOGY PROGRAM KEEPS FAMILY TREE DATA FOR 7-9 GENERATIONS (MEN DEP), PEOPLE, RELATIONS, ASSEMBLES ORGANIZES. PHOTOREADY PRINTS. 32K EXT TP/DSK \$20.00

"INVENTORY ONE" (ALAN ROUSE) EFFICIENT FOR BUSINESS, HOME, CLUB. 32K+14B RECORDS. PRINTS STATUS REPORTS AND REORDER REPORTS. 16K-32K EXT TP/DSK \$30.00

"KNIX DRAF" 80-COLUMN PRINTER WITH TRS-80 MODE BLOCK BRAPNICS PRINTS PHOTOREADY BARBGRAPHS. NO SCREENPRINT PROGRAM REQUIRED. EXCEPTIONAL! 16K EXT TP/DSK \$20.00

"ADDRESS ONE" ADDRESS FILE DATABASE. SEARCH, PRINT, VIEW I-UP LABELS, OTHER DATA. 16K EXT DSK \$20.00

"SPEED MATH" (T. BRAY) LEARNING GAME FOR PARENTS AND CHILDREN, TEACHERS. MAKES MATH FUN FOR ALL AGES. GAME SCORING AND SKILL LEVELS. PROVEN. 16K EXT TP/DSK \$8.00

"FILE TWO" A DATABASE PROGRAM LETS YOU PUT COMPUTER TO IMMEDIATE USE. MAKE THIS PROGRAM A FIRST PURCHASE. WITHIN MINUTES, MENU HELPS YOU CREATE AND NAME UP TO 10 FIELDS. YOU CAN ENTER, EDIT, DELETE, DISPLAY, SEARCH AND LOCATE ANY RECORD BY NUMBER OR BY FIELD CONTENTS. MACHINE LANGUAGE GIVES "SUDDEN SORTING". HAS 2 TOTAL FIELDS FOR ACCOUNTING USE. PRODUCES MAIL LISTS. MEMORY SAVING. BOOD! 32K EXT TP/DSK \$20.00

"FILE ONE" A DATABASE PROGRAM MUCH LIKE THE ABOVE. FREE FORMAT RECORDS, M/L SORT. 32K EXT TP/DSK \$20.00

"CAVE OF ALLAN" HIGH RESOLUTION BRAPNICS ADVENTURE. ONLY MINDPOWER CAN HELP YOU FIND THE TREASURE, ESCAPE THE VALLEY OF MYSTERY. MINDPOWER! 32K EXT TP/DSK \$15.00

WEST BAY COMPANY



ROUTE 1, BOX 666
WHITE STONE, VIRGINIA 22578

POSTPRID. VR ADD 4% TAX. SEND BRSE FOR PROGRAMS LIST

N-Fix, but not available as Pass the Hat programs.) It will work with a single drive but it will be necessary to eliminate some of the auxiliary files supplied on the disk. To facilitate easy distribution, the instruction manual comes as a text file on the disk. Also included on the disk is the original *Spell-N-Fix* program which uses the same core dictionary as the newer version. The original is included because it works somewhat differently and may be preferred for some situations. This program is designed to work with any ASCII text file and can be configured to work with any word processor. I have used it with *Telewriter-64* with no modification.

One of the most significant differences between the original and the new version is the screen display. *Spell-N-Fix II* uses a high resolution character set to show true lowercase characters. Also, the start-up routine automatically configures the operating system to use a 20 millisecond (ms.) track-to-track stepping rate instead of the normal 30 ms. This is very useful with a program of this type which accesses the disk so often. The higher stepping rate works with my disk drive; I have one of the original TEC version Radio Shack drives (lucky me). Faster stepping rates are also available if you have a drive that can handle it.

Operationally, another major difference between the original and the new *Spell-N-Fix* exists. The new version displays your file on the screen as it searches through the 20,000 plus word dictionary. This has mixed blessings. If you are correcting a long file, you may not appreciate the extra time that it takes, displaying each suspected incorrect word in context waiting for a response from the operator. But there is also a very big advantage to doing it this way. When a suspected word is found, you can enter the dictionary and look up similar words to see if you can find the correct

spelling. This makes spelling correction very simple. This look-up feature is also available in lieu of performing a normal spelling check on a file. There are many convenience features like this built into the *Spell-N-Fix II* program. Of course, the standard features expected of a spelling checker, like adding your own words to the dictionary, are included.

I have used a variety of spelling checker programs on professional business systems. With software like this, the major difference between the Color Computer and a several thousand dollar business system is the lack of joystick ports on the business system. This is a very useful and professional program.

Let me end this review with this recommendation. If you are in need of a quality spelling checker, send a CoCo formatted disk to Star-Kits along with an addressed and stamped return mailer. You won't regret it. Remember that this is not really meant to be free software. Contributions should be made based on what you believe is the value of the program. This type of software distribution is unique and has many attractive features including the opportunity for the buyer to determine the value of the program from use rather than from an advertising description. This distribution method will only work and grow if the end users are honest and generous in their payment.

(Star-Kits Corp., P.O. Box 209, Mt. Kisco, NY 10549, RS DOS required)

— Tom Szlucha

STOCK & FUND INVESTING

with the

TRS-80* COLOR COMPUTER

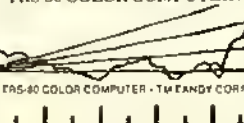
USE FUNDGRAF AND FUNDFILE

FUNDGRAF is a stock market analysis program that not only graphs and analyzes funds or stocks, but also makes decisions on when to BUY and SELL. Improve market timing using your COCO.

GRAPHS fund's progress (up to 200 weeks). SUPERIMPOSES for comparison: a line of constant percent growth or a graph of any other fund (or stock). CALCULATES over any time span: the percent price change and the moving average (any span). INDICATES BUY and SELL signals. FUNDGRAF requires 16 K ECB min.

16/32 K Tape \$49.95
16/32 K 5 in. Disk \$69.95
ADD \$2 handling on all orders.

FUNDGRAF—A STOCK
MARKET ANALYSIS
PROGRAM FOR 16K EX
TRS-80 COLOR COMPUTER



FUNDFILE is a portfolio and account management program for securities. Manage single or multiple portfolios of stocks, mutual funds, bonds, money market funds, etc. FUNDFILE allows easy maintenance of all your records for accurate portfolio evaluation. NEW 32K VERSION of FUNDFILE summarizes all transactions (dividends, interest, purchases and sales) between any two dates of your choice: weekly, yearly, etc. Categorizes interest and dividends paid as to tax liability (tax free, etc.) and capital gains as long or short term. Great for tax reports.

FUNDFILE REQUIRES 16 K ECB min. and 80-COI. PRINTER.

5-in. Diskette only for 16 K ECB \$27.95
5-in. Diskette only for 32 K ECB \$37.95
ADD \$2 handling on all orders.



Write for free brochure for details. Dealer inquiries invited.

PARSONS SOFTWARE, DEPT. G
118 WOODSHIRE DRIVE
PARKERSBURG, WV 26101

Co Co - Cooler



• Brings operating temperature to ambient, regardless of accessory load

• Reduces temperature of ENTIRE computer... not just the SAM chip

• Easy 1-minute installation

• \$39.95

Companion Keyboard Cover \$7.95

Co Co Software

NOW SHIPPING

Co Co - Cooler Too

(Same Price, Same Fit, For Color Computer II)

- For Fastest Service Send Money Order Or Certified Check
- Add \$2.00 Shipping For Continental U.S.
- Add \$4.00 Shipping For Alaska, Hawaii, Canada, & APO's
- Add \$15.00 Shipping For Overseas
- Add \$3.00 For 220-250 Volt Model
- Calif. Residents Add 6 1/2% Sales Tax
- Will Ship C.O.D. On U.S.A. Shipments Only
- All Merchandise Shipped From Stock

REM Industries, Inc.

9420 "B" Lurline Ave., Chatsworth, CA 91311

(818) 341-3719

Protect Your Software With *Pirator*

You have always had the dream of marketing your own software. You listen to the experts and find out that the marketing costs are astronomical. What can be done to protect your investment from piracy? A program available from Sugar Software is one answer to the dilemma. *Pirator* is a total marketing package for software authors. It fulfills several vacancies in the software market. Not only does it provide security, it also is a graphics editor for title screens, and a means of mass copying the master disk.

Pirator requires a Disk BASIC system with at least one, preferably two or more, drives.

Semigraf

Included in the package is *Semigraf*, a graphic editor for the creation of nifty title screens. *Semigraf* was reviewed in the July 1984 RAINBOW and needs no further comment other than to say that it is well suited for this type of display and easy to use. Instructions are also given on conversion of graphic displays generated by other programs, such as *Art Gallery*, for use as title screens for your presentation.

Combiner

Another utility that is quite useful is named *Combiner*. This program allows the BASIC programmer to combine

machine language subroutines with the BASIC program in a single file. The machine language program must be in position independent code as it is appended to the end of the BASIC program.

Programming With *Pirator*

Pirator will protect both machine language and BASIC programs with a minimum of constraints. One important warning is given regarding memory conflicts. Specifically, a machine language program has to be located above the memory used for the title screen. Adequate discussion of this subject is in the 32-page user's manual including a memory map of the system.

After either loading or creating a title screen, the rest of the procedure is simply filling in the blanks on a menu-driven screen. Each protected disk is given a serial number along with any owner information you desire. After filling in this information along with your choice for the drives for the source and target disks, protected copies with consecutive serial numbers are cranked out as quick as a normal backup procedure. If the target disk is not formatted *Pirator* will format it for you. The target disks load and autostart by a `LOADM"FILENAME"`.

Does It Work?

We tried all of the disk-copying utilities at our disposal and none would break the protection scheme used in *Pirator*. I don't know, and don't want to know, how it is done, but it is far superior to any protection scheme on the market today. I guess the price of the program is a little steep, but so is the cost of writing good software. If you're serious about marketing CoCo software, this is an excellent investment.

One interesting note of caution. After ordering *Pirator* you will have to register your copy and obtain information on a validation file for your disk. The program will work as delivered but an extra heap will be present on all target copies until the validation file is added to your disk. One other thing I noticed in the "fine print" is the agreement that *Pirator* can be used for only 500 copies per year without seeking an additional royalty agreement with Sugar Software. It always pays to read the fine print.

(Sugar Software, 2153 Leah Lane, Reynoldsburg, OH 43068, disk \$99.95)

— Dan Downard

Hint . . .

A Brighter Look

I have found that forcing the color set select signal high switches the video display generator to the opposite color set. That color set gives a brighter display on my monitor. To find out if this would be of benefit to you, try the following program:

```
10 POKE 65314,11
20 GOTO 10
```

Run the program and you should see an improved display.

To make a permanent change pull the video display generator chip. Bend pin 39 on the chip up so that it won't go back in the chip socket. Pin 39 is the color set select signal. Add a wire from pin 17 on the chip to pin 39 on the chip. This is +5V which holds the color set select signal high. Reinstall the chip in the socket.

Jim Rice

• RADIO SHACK™ COLOR COMPUTER ADVANCED MATH PROGRAMS for ENGINEERS • PHYSICISTS • STUDENTS

FUNCTION GRAPHING MODULE 16K EXT-\$19.95

- * HIGH RESOLUTION GRAPHS
- * GRAPH ANY FUNCTION — 4 AT ONCE
- * PARAMETERS EASY TO CHANGE
- * AUTO-SCALING OPTIMIZES GRAPH SIZE
- * COMPUTE FUNCTION VALUES & ZEROS
- * INTERSECTION OF FUNCTIONS
- * COMPLETE MANUAL — PROGRAM ON TAPE

CALCULUS MATH MODULE 32K EXT-\$37.95

- * INCLUDES THE GRAPHING MODULE ABOVE
- * LOAD UP 9 FUNCTIONS AT ONCE
- * FIND AND COMPUTE MAXIMA & MINIMA
- * NUMERIC INTEGRATION & DIFFERENTIATION
- * COMPOSITE AREAS
- * HANDLES PIECEWISE CONTINUOUS FUNCTIONS
- * HARD COPIES OF DATA AND/OR GRAPH
- * COMPLETE MANUAL — ON TAPE OR DISK



CALCSOFT
P.O. BOX 401
ST. ANN, MO 63074



SEND CHECK OR MONEY ORDER
Add \$2.00 for shipping

New Advantages Possible With *Disk VIDTEX*

You may remember that the first terminal program for the CoCo was *Videotex* from Radio Shack. It was designed for use with CompuServe's then-new information service. CompuServe worked out a "protocol" for screen formatting and low-resolution graphics based on what the CoCo was capable of. There have been a number of other terminal programs for the CoCo, many of which had some of *Videotex*'s special capabilities. The present version of *Videotex* can download and upload cassette files to and from CompuServe using the "B" protocol, which provides full error checking, and all versions display medium-resolution graphics. CompuServe has been releasing greatly expanded versions of the *Videotex* programs for various computers; Radio Shack carries versions for the Model I/III, 4 and 2000, which they call *Videotex Plus*. CompuServe markets a similar CoCo program called *Disk VIDTEX*.

Disk VIDTEX doesn't have a Hi-Res text display, like some other terminal programs do. It does have lowercase displayed as reversed characters, and should work with lowercase boards such as the Green Mountain Micro Lowerkit. You can select either black letters on green or green on black. All of the *Videotex* features, especially

designed for CompuServe operation, still apply, including the Lo-Res color graphics and downloading. Downloading in this case is to disk; when you ask to download a file, CompuServe checks to see what terminal program you're using and then asks for a filename. The terminal program and the host computer interact to transfer the file, check for errors and save it to your disk while you go put out the cat or whatever. Uploads work the same way.

The big advantage of *Disk VIDTEX* is its vast array of new features such as automatic logon, buffer storage of incoming text, function keys and an array of other goodies. There are 22 special features that are accessed by pressing the up arrow and a letter. Pressing up arrow and 'M' gives you a set of three menus for the various functions.

Updates to *Disk VIDTEX* are handled on the CompuServe system by downloading the new version to you; the system will also tell you if you already have the current version.

Aside from built-in lowercase, *Disk VIDTEX* has everything I think a terminal program used with CompuServe should have. For bulletin boards and other such things, I prefer other general purpose terminal programs, but I use *Disk VIDTEX* every time I logon CompuServe.

(CompuServe, 5000 Arlington Centre Blvd., Columbus, OH 43220, \$39.95)

— Ed Eilers

BASEBALL FANS !! COLOR-STAT STRATEGY BASEBALL GAME

32 K DISK
EXT BASIC
COLOR COMPUTER



27.95
& 2.50 postage
and handling

Replay Any Season

YOU ARE THE MANAGER

BRETT & DAWSON

AARON & PALMER



-- YOU SET THE TEAMS --
- SOLITAIRE OR HEAD TO HEAD -



SEND CHECK
OR MONEY ORDER

TO: PINTO PRODUCTS
718 Fiji Circle
Santa Ana, CA 92704

"Good Memory Database"

(FROM 9/84 RAINBOW REVIEW). CALL FOR FREE REPRINT!

DISK & PRINTER ARE OPTIONAL IN THE SUPER-FRIENDLY DO-FILE SYSTEM: NEEDS ONLY TAPE, 32K & EXT. BASIC. ALL WORK DONE IN MEMORY. NO PROGRAMMING REQUIRED TO BUILD HOUSEHOLD INVENTORY, WINE LIST, ANY LIST. YOU DESIGN YOUR OWN RECORDS. AND - YOU DON'T HAVE TO GET IT RIGHT THE FIRST TIME. EXPAND ANY FIELD. ADD NEW FIELDS - WITHOUT LOSING ANY EXISTING DATA. CREATE, REMOVE AND CHANGE RECORDS - SEARCH, SORT, LIST AND TOTAL THEM - LOAD AND SAVE FILES USING CASSETTE OR DISK (OR BOTH). DISPLAY YOUR RECORDS ON THE SCREEN AND/OR PRINTER IN ORIGINAL OR SORTED SEQUENCE (OR BOTH). SELECT AND SORT (ASCENDING OR DESCENDING) RECORDS ON UP TO 3 FIELDS. YOUR FILES CAN BE AS BIG AS 16,500 CHARACTERS. DO-FILE HAS EASY, ONE-KEY COMMANDS AND A HELP MENU. TOO, IT IS EVEN DESIGNED TO PROTECT YOU FROM MAKING MISTAKES! DO-FILE IS EDUCATIONAL - YOU LEARN FILE MANAGEMENT USING A 35-PAGE TUTORIAL GUIDE & SAMPLE DATA FILE!

CALL FREE! 1-800-334-0854, EXT. 856. TO ORDER, DR. SEND \$29.95 (CHECK OR MONEY ORDER) PLUS \$2.00 FOR POSTAGE/HANDLING (PA RESIDENTS ADD \$1.92 TAX). TO:

SOLID



SOFTWARE



P.O. Box 712 • Levittown, PA 19058

Upgrade Your DOS With Full Screen Editor

Looking through this issue of RAINBOW, it becomes obvious that there are utilities currently available to assist you in nearly any task you can imagine. My wife will swear that I own one of each . . . she exaggerates! Nevertheless, I will admit to having many utilities of which the most valuable is a full screen editor. If you have never used this type of editor before, you cannot possibly imagine what you are missing. Having just recently upgraded to disk, I was very pleased to receive DSL's new disk-oriented *Full Screen Editor* to review.

The machine language program is two disk versions, a 16-32K and a 64K version. Also included are four pages of instructions and a very well done HELP program that, when run, actually walks you through the various options demonstrating very clearly how the editor works. The 16-32K version is divided into several smaller programs to conserve memory and, therefore, uses between a minimum of 2066 bytes and a maximum of 3787 bytes. The 64K version is the better choice since it loads all ROM plus itself into the upper 32K, thereby using none of your valuable RAM.

For those who are not familiar with a full screen editor, I'll

briefly outline the options. With the editor you have the ability to move the cursor anywhere on the screen using the four arrow keys. This means you can list several lines of a program and then simply move the cursor to the line requiring a change and type over existing characters, delete characters or insert new characters. There are no complex editing commands to remember, just use the arrow keys. In addition, the SHIFT left-arrow deletes characters and the SHIFT right-arrow inserts blanks. Many other possibilities also become apparent as you learn the ropes. For instance, suppose you want to move a line from one spot in a program to another. Simply list the line, move the cursor over the line number, type the new line number and ENTER. Now just delete the original line and you are done.

Full Screen Editor, however, does more than just edit. First, there is an automatic line numbering command where you enter the starting line and the increment, and whenever you press ENTER the editor responds with the next line number. This is a must for your own programming efforts and can make entering most programs much easier. Next, a new form of the LIST command has been added which allows you to scroll through a BASIC program, forward and backward, using the arrow keys. (It temporarily turns off the full screen editor.) Also, a new form of the DIR command is included that displays programs on disk a screen full at a time and prefixes each program with LOAD or LOADM. Using the arrow keys you then move to the program to be loaded and press ENTER. The new DIR command also allows you to enter a single letter upon which only those files beginning with that letter will be displayed.

Finally, DSL has included a search and change command. This command has several options allowing you to search a BASIC program for any combination of characters and returns the line numbers of any matches. It also allows you to search and change anything in the program. It can even prompt you prior to each change. For instance, if your CoCo will not accept the POKE 65495,0 (high-speed poke), you can simply change all occurrences of 65495 to 65494, thereby disabling the high-speed poke.

Overall, this is an extremely well-written program. If you already own a full screen editor, you'll have to decide whether the extra options make it worth the cost. If you don't own a full screen editor, take my advice and get one. There are several available and DSL's certainly ranks among the best. One final note for those of you who have chosen "the" alternate operating system, JDOS. Have no fear, based on my testing, *Full Screen Editor* appears compatible.

(DSL Computer Products, Inc., P.O. Box 1176, Dearborn, MI 48121, disk \$19.95)

— Ken Boyle

WANTED!

Young men and women seeking adventure, excitement and thrill-a-minute action. No experience necessary—just you and your Color Computer. See below:

FOR THE 32K THRILLSEEKER

	TITLE	DISK	CASS.
NEW!	MR. DIG	\$27.95	\$25.95
NEW!	CANDY CO.	29.95	29.95
NEW!	WILLIE'S WAREHOUSE	29.95	29.95
NEW!	ICE HOCKEY	—	21.95
	ZAXXON	29.95	—
	PROTECTOR II	—	29.95
	DESERT PATROL	—	21.95
	ICEMASTER	—	21.95
	FOODWAR	—	22.95
	WACKY FOOD	—	19.95
	CASHMAN	—	24.95
	CHOPPER STRIKE	—	24.95
	TIME BANDIT	—	24.95

LOTS OF PLAY FOR 16K

	MOONSHUTTLE	—	\$26.95
	FROG TREK	16.95	14.95
	3-D TIC-TAC-TOE	18.95	16.95

Interested applicants send check or m/o to:
OELRICH PUBLICATIONS, INC.
4040 N. NASHVILLE
CHICAGO, IL 60634

Credit card orders call: 800-621-0105

(In Illinois call: 312-545-9286)

NO SHIPPING CHARGES!!!



PARALLEL PRINTER INTERFACE

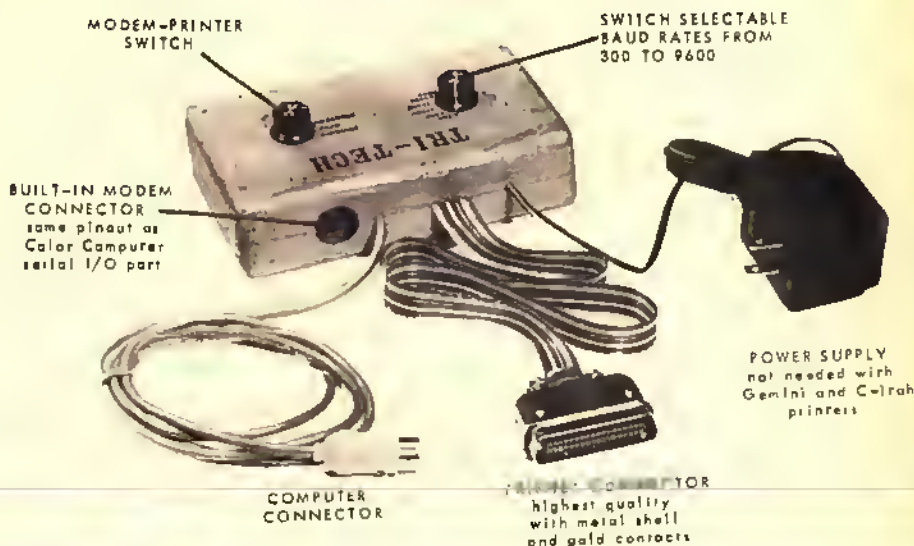
WORKS WITH ALL STANDARD
PARALLEL PRINTERS

\$59.95

MODEL 1
(with modem connector
and switch)
without power module---\$ 54.95

\$49.95

MODEL 2
(without modem connector
and switch)
without power module---\$ 44.95



ADD 3.00 FOR SHIPPING AND HANDLING

PRINTERS

- * C-128H 8510AP PROWRITER-----319
10" carriage
- * C-128H 1550P PROWRITER 2-----510
15" carriage
- * C-128H 8510BPI-----389
switch selectable between
IBM compatible or Prowriter
compatible
- * C-128H 8510SP-----435
new!! 180 cps.
- * C-128H 8510SCP-----499
new!! 180 cps. color printer
- * GEMINI 10X-----275
- * GEMINI 15X-----399
- * DELTA 10X-----415

PLUS SHIPPING

SPECIAL SYSTEM PRICE !!

When a printer and the TRI-TECH
Interface are purchased at the same
time, you can deduct \$10 from the
system price.

SPECIAL OF THE MONTH

PRINTER/ INTERFACE SYSTEM

- * STAR GEMINI 10X
120 c.p.s.
bit image graphics
5 different character sets
1-year warranty on
parts and labor

- * TRI-TECH PARALLEL INTERFACE
MODEL 2

\$299.95

- * TRI-TECH PARALLEL INTERFACE
MODEL 1

\$309.95

EFFECTIVE THRU NOVEMBER 30, 1984

DISK DRIVES

- TEAC FD54A DISK DRIVE-----119
single sided, half height,
40 track, 180K bytes.
- TEAC FD55A DISK DRIVE-----145
(Teac's best single sided drive)
half height, 40 track,
180K bytes.
- TEAC FD55B DISK DRIVE-----179
(Teac's best double sided drive)
half height, 40 track,
360K bytes.
- TEAC FD55F DISK DRIVE-----209
double sided, half height,
80 track, 720K bytes.
- J&M DISK CONTROLLER-----129
your choice: JDOS or RSDOS ROM
(totally Radio Shack compatible
with RSDOS ROM)
- DUAL DRIVE CASE AND
POWER SUPPLY-----59
- DUAL DRIVE CABLE-----23
- SENTINEL DISKETTES-----24
single sided, double density,
lifetime guarantee.
- SENTINEL DISKETTES-----30
double sided, double density,
lifetime guarantee.

PLUS SHIPPING

TRI-TECH ELECTRONICS
P.O. BOX 8100 ROCHESTER, MI. 48308
313 254-4242

Mr. Dig Keeps You Picking And Grinning

Last weekend I visited my CoCo farm to pick some luscious, ripe cherries. I walked along each grove picking cherries and humming my favorite tune ("Somebody's Watching Me"), occasionally passing some apple trees. As I was half-way down a cherry grove I felt that eerie, paranoid feeling each of us has had at least once in our lives, someone or something — was behind me. I quickly turned and there was a creature with a blue head and tan body running full-speed toward me. It was "the Meanie," a vicious little monster who loves to eat cherry pickers more than cherries. In haste, I made a sharp right turn in front of an apple tree, shaking the leaves as I passed, and an apple fell, landing on the pursuing Meanie's head. It squashed him. I, Mr. Dig, fought another battle against the nasty gang of cherry grove pests who make my cherry-picking life miserable . . . and dangerous.

Mr. Dig is a fun, strategic game requiring 32K, one joystick and one player, and is available on disk or tape. After loading this assembly language program, the word "blue" will fill the screen. Press the Reset button until the words are colored blue. Then, after pressing the fire button on your joystick, you will be greeted with a colorful graphics page showing Mr. Dig (a cute little character who looks like he's wearing a stocking cap and holding a shovel in his hand). When you press the fire button again you will see another graphics screen asking you to pick a skill level (simple, hard or "no way"). You do this by moving your joystick to the desired level and pressing the fire button. Next, the screen will display the nasty cherry grove pests you'll be encountering: Meanies, described above; Miners, big mouths with white, sharp teeth; Mallers, faces with large white eyes and mouths; and Letter Monsters, creatures with fat stomachs displaying any letter in the word "extra" on their tummy.

Using the right joystick, Mr. Dig, who starts at the bottom center of the screen, may be maneuvered around the CoCo farm clearing tunnels and cherry groves in his path. The object of *Mr. Dig* is to eat all the cherries and accumulate as many points as possible while avoiding the nasty avengers whose sole purpose is to eat Mr. Dig. To pick a cherry, move Mr. Dig over the top of it. Each eaten cherry is worth 50 points, and if Mr. Dig eats eight cherries without stopping, you are awarded 500 points.

Along the journey you will encounter apples which you may use to kill (or squash) the pursuing creatures. There are two ways to drop the apples on their heads: dig the ground underneath the apple by running under it so it will fall, or push the apple (left or right) until it falls down a vertical tunnel. However, an apple won't fall until Mr. Dig hacks away from it. Try to hit as many Meanies as you can with a single apple because you will accumulate more points. For instance, the first squashed Meanie is worth 1,000 points; any additional Meanie is 2,000 points. Sometimes after an apple falls and cracks open, a diamond will appear. If you get it, you will receive 10,000 points and be moved to the next screen.

The sound is very good and adequately depicts each play in the game. For example, when a Meanie is hit by an apple a 'squashing' sound is heard. When Mr. Dig dies or it's the end of the game, a melody implying doom resounds. But when Mr. Dig clears a screen or gets enough points that he goes to the next screen, a pleasant melody is heard.

Another way to kill your pursuers is to throw a Power Orb at one by pressing your fire button on the joystick. Be careful, though, after you've thrown a Power Orb it takes a short while to throw another one, so steer away from the nasties, especially during this time.

When all the Meanies have left the screen, there will be a "treat," which resembles a pound sign, in the middle of the screen. If Mr. Dig runs over it, a beeping noise will resound along with a bright flash of the screen and all the new Meanies will freeze. Three Mallers will appear with a Letter Monster. If you hit this creature with your Power Orb or an apple, you will light up the letter located on its belly. If you light up all the letters in the word "extra," you will be awarded an extra Mr. Dig.

Every time a Meanie, Miner, Maller, or Letter Monster touches Mr. Dig, he dies. Keep a close eye on the Meanies because they will mutate and become Miners who can dig the ground from under Mr. Dig, also causing his death. Mr. Dig has four lives in a game. During each game, in the upper-right corner of the screen, your score is displayed along with the highest score located above it. The word "extra" is also displayed in the top middle of the screen, with the highlighted letters you have Power Orbbed.

The documentation is good and accurate except in the beginning paragraph. It tells you to *LOADM*MRDIG* if you are loading from disk. This does not work; you must *LOADM*MR-DIG*. Other than this small error, the documentation is more than enough to supply you with adequate information to play the game. As in any game, the best way to get the most points is to practice (which the documentation reminds us). Through repeated plays you will see the best strategies for you (whether eating cherries and pushing apples is your defense, or throwing Power Orbs at Letter Monsters).

Overall, *Mr. Dig* is a very good, fun game with excellent use of graphics and sound. Perfecting strategies and just playing for fun will keep you on your CoCo farm for hours . . . even days. Just watch out for nights, that nasty gang of cherry grove pests are harder to find in the dark.

(Computerware, Box 668, Encinitas, CA 92024, 32K non-ECB, tape \$27.95, disk \$30.95)

— Susan Remini



"Al, do we carry inter-galactic space travel software?"



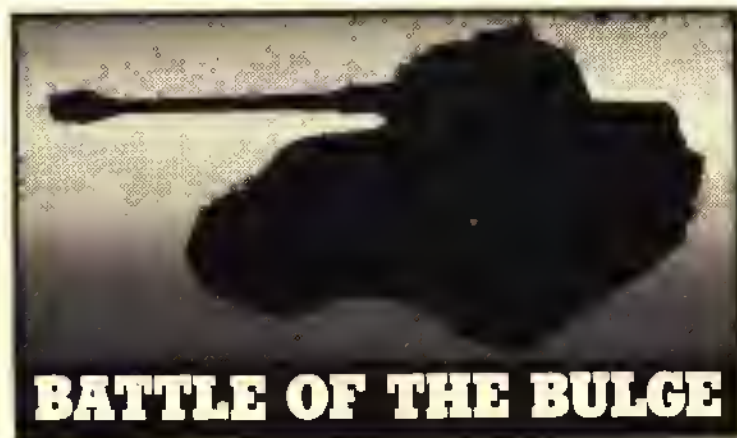
Battle of Midway

CINC PAC — Battle of Midway 32K

Ark Royal's masterpiece game of naval strategy of perhaps the most important battle in the history of the United States Navy. Hi Res graphics, 75% machine language allows player to control as many as 41 separate units on the screen at one time. Command Task Forces 16 & 17 as they play cat and mouse with the Japanese fleet. Maneuver the Hornet, Yorktown and Enterprise into the best position. Set courses and launch search and attack aircraft then hope for the best. Find the enemy fleet, then pick the targets: Akagi, Soryu, Kaga, Yamato and others in this historically accurate game. Relive history, Admiral, and it won't be any easier this time around. Anchors Aweigh.

Game save. Requires disk version to operate on disk. Cassette \$27.95.

Comes with House to House game map, more than 10 scenarios, on 2 cassettes, or all on 1 disk...\$29.95. (Disk included.)



BATTLE OF THE BULGE

BATTLE OF THE BULGE 32K

Ark Royal's 1 or 2 player game by the author of Battle For Tunis, Bulge recreates operation Wacht Am Rhein, Hitler's last desperate gamble of WWII. In none of our games is the fog of war so apparent than in BULGE. You know the Germans have attacked in the Ardennes, but little else. What is their strength? Their objective? Who do you send to repair the huge gap in the American lines? What bridges do you blow? Can you protect the fuel depots? Where are all those Tigers coming from? When will the weather clear?

Historically accurate, and a real challenge whether it be against the computer or a friend. (Just don't humiliate him too badly.) A game you've been waiting for. Cassette \$25.95.

COMPANY COMMANDER



COMPANY COMMANDER 32K

Game module 1 — House to House. Ark Royal's squad level WWII Infantry combat game.

They said it couldn't be done — a SQUAD LEVEL wargame on a computer — but we've done it. The Line of Sight problem is licked — and the machine language routines really speed things up.

Game Module #1 comes with House to House map and 10+ scenarios involving Infantry combat in Aachen, Caen, Arnheim, Stalingrad and other famous WWII city battlegrounds. Combat units include rifle squads, mortar teams, machine gun crews, engineers, and more (depending on the scenario chosen), leaders, vehicles and other weaponry of WWII. Unique design allows incorporation of future expansion modules.

Choose campaign play and put yourself on the battlefield, Corporal Smith or Jones; collect points toward promotion. Order up smoke from the mortar squad, HE for those dug in units. Take the objective and you might make Major someday. Just don't step on a land mine.

OTHER ARK ROYAL GAMES... Some at reduced prices!

Across the Rubicon 32K
(Feb '84)* \$24.95

Across the Rubicon 16K
(Dec '82)* \$14.95

Mission: Empire 32K
(Oct '82)* \$22.95

Mission: Empire 16K* \$17.95

Galactic Talpan 32K
(May '84)* \$17.95

Starblazer 32K
(Apr '84)* \$17.95

Bomber Command 16K
(Jan '84)* \$22.95

Waterloo 32K
(Mar '84)* \$22.95

Guadalcanal 32K \$24.95

Battle For Tunis \$24.95

Legatus
(Disk only) \$29.95

Kamikaze 32K
(Apr '83)* \$19.95

Kamikaze 16K \$14.95

* Denotes Rainbow review month

ARK ROYAL GAMES

P.O. Box 14806
Jacksonville, FL 32238
904-786-8603



Prices on all games include shipping. Florida Residents add 5% tax. All games available on disk, add \$3.00. All programs shipped within 24 hours regardless of check or money order. We pay shipping to U.S. and Canada. Others add 10%. Dealer inquiries invited. COD's accepted. All Programs require Color Computer™ (Tandy Corp) or TDP System 100 Computer™ (RCA).

Easy-File Is a Good Data Management System

Easy-File is one program that lives up to its name. In fact, *Easy-File* is so simple to use that the last thing you should do is read the instructions.

I'm one of those people who gets a new toy or Jungle Gym and immediately goes to work putting the project together. Instructions are to refer to only if you get confused. For some reason, I decided to read every word of the instructions before working *Easy-File* — a big mistake.

Easy-File comes professionally packaged in a loose-leaf notebook, it's typeset, easy to read, well-indexed and written as a tutorial. It is probably one of the best looking packages I have yet seen for CoCo software. But by the time I finished reading the tutorial, I was almost afraid to *RUN "EASY FILE"* — it sounded all so complicated with eight individual programs and numerous special alternates and options.

I was pleasantly surprised when I turned on the machine and got started. This computer file could almost work itself — it is that easy to use. It prompts you for everything it needs to do the job for you.

At first, you are asked to tell it how many disk drives you will be operating. Next it wants to know what day it is. Then it is menu time, and what you get is the full course menu. It is also at about this point that you realize your familiar upper-case type with reversed colors to indicate capital letters have

been replaced with a true upper-/lowercase typeset that is harder to read. It's Mark Data's *SUPER SCREEN* which comes with *Easy-File*. It does make the on-screen information look better, so I guess I could get accustomed to it, even learn to like it.

When you select one of the options, your disk drive starts and replaces the *FILES.BAS* program with one of the other seven programs on the disk. This limits the amount of memory required for the working program and switching from one program to another is quick and easy.

Even creating new disk files is simple. *Easy-File* asks for everything it needs to set up the file. For those of us who got involved in the earliest data management systems for our 4K, 16K, 32K then 64K machines, we got used to limiting every file to eight fields. *Easy-File* allows 30 fields per record. Each field is designated either (A)lphanumeric, (N)umeric or (D)ollar. Numeric fields can be added and Dollar fields are formatted automatically.

You also have the option to make certain fields unavailable to the keyboard operator so that someone could not get into your file and change data. That, along with the option to include a password, gives the owner some extra security for their files.

Fields with "NAME" in them are specially treated. All name fields are entered last name, first name, middle initial — it can be printed in that manner or reversed to give you first name, middle initial, last name. "DATE" fields also get special treatment — they are automatically formatted MM/DD/YY and require six characters. That's nice, but it will cause problems for genealogists like myself who need a MM/DD/YYYY format (I wish there were some way that I could override the automatic format if required).

There are so many features to this program I cannot begin to list them all and most people probably could never use them all — but it is lean and quick (with the possible exception of the *SORT.BAS* program which takes quite a bit of time to read and sort each directly entered file, then creates an index for future use).

Printing reports is also easy. The printing routines are set up for Okidata printers and should operate on most others without change — but if a change is needed, complete instructions are included in the appendix. The various report options make some good-looking reports with the information you want included, in the order you want it and without things you don't want. Of all of the files programs I have seen, this one is the easiest to set up and the most flexible.

And now the bad news. For some reason *Easy-File* thinks that my paper is 63 lines long when it is 66 lines long. My reports came out three lines short per page, which means my work doesn't start at the top of each page. I feel certain that the wizards at Mark Data have a solution to this and I intend to ask them (when I ask about the date format). With these enhancements, there is no question that I will buy *Easy-File* for my personal software library.

I would, however, offer one bit of advice to Mark Data — simplify the instructions. We reviewers generally criticize software for a dearth of documentation but in this case, it could be done in half the words. *Easy-File* is so easy it virtually speaks for itself.

(Mark Data Products, 24001 Alicia Parkway, #207, Mission Viejo, CA 92691, 32K, disk \$59.95)

— Glenn B. Knight

THE SOFT SHOP

"For all your personal computer needs"

64K Ram Chip Set	\$ 55.95
Super Pro Keyboard Kit	65.95
Prowriter Printer (8510A)	365.95
Drive #0	359.95

-- ARCADE ACTION --

	TAPE	DISK
Zaxxon (Datasoft)	(32K) 29.95	32.95
Pooyan (Dalasoft)	(32K) 27.95	30.95
CU*BER (Tom Mix)	(32K) 26.95	29.95
Color Outhouse (Computer Shack)	(32K) 26.95	29.95
Calisto Island (Mark Data)	(32K) 23.95	26.95

* SUMMER SPECIAL * FREE SHIPPING ON ANY GAME *

** For the serious Coco user **

	TAPE	DISK
Basic09 (Req. OS-9)	--	89.95
Dynaslar/Dynaform (Req. OS-9)	--	95.99
VIP Writer (Softlaw Corp.)	**	55.95
VIP Terminal (Softlaw Corp.)	**	45.95
VIP CALC (Softlaw Corp.)	**	55.95

Tape Version Included

Call or write for a catalog

Call our BBS on-line from 10 p.m. to 7 a.m. EOT!
Phone (803) 288-0613

Terms: Money Orders and Personal checks welcome (Please allow an additional 2 weeks for personal checks).

Shipping: \$3.00 for Software, 3% for Hardware.
C.D.D.: Please add \$3.00, Blue label add \$3.00 - S.C. residents add 4% sales tax.

Handling: Handling Charges will be added to orders outside the continental U.S.

VISA and MASTERCARD ACCEPTED.

THE SOFT SHOP

P.O. Box 878 Mauldin, S.C. 29662
10 a.m. (803) 297-1067 8 p.m.

Learning Games — A Three-Program 'Classroom'

Learning Games is an educational package containing three programs which teaches youngsters to discriminate shapes, recognize and spell simple words, and count objects.

Learning Games comes on tape and, according to the author, is appropriate for ages three to eight. The age range may be valid, but each game is not appropriate for the entire age span. The games are in the form of a drill and practice session, with the game's contents remaining the same and the child scoring on his/her performance each time.

Let's look at each game separately to see which ones might appeal to your child and are appropriate to his skill level. All three games use vocal instructions and prompts within the program, with the first two games requiring the use of joysticks. System requirements call for a minimum of 16K with Extended BASIC.

Game one is called *Shapetest*. After the program is loaded and you are treated to a brief musical interlude, the program begins by introducing the shapes which will be used in the drill portion of the game. Remembering the age range three to eight, consider the shapes introduced: square, circle, ellipse, rectangle, triangle, hexagon, octagon, parallelogram, and trapezoid. All 10 shapes are introduced before the drill begins. Right here is where I find something amiss. The circle is not round (it is a fat ellipse). And the vertical sides on the square are longer than the horizontal sides (it is, in fact, a rectangle). It's true that the shapes are usually distinct enough that a child will probably be able to learn which ellipse the computer wants him to call a circle, and which rectangle is supposedly a square, but the program, in essence, is teaching an incorrect answer.

In the revised program documentation, the author suggests that the distortion in circles and squares may be eliminated by adjusting the horizontal width and vertical height controls on the TV. Check your TV before assuming you can do this. Two of my three televisions do not provide for consumer adjustment of these functions.

In the drill, three shapes appear on the screen and the voice on the recorder asks the child to move the blinking cursor with the joystick to the stated shape and then push the button. If the child is correct, the program rewards him/her

with a randomly selected colorful, whimsical picture, accompanied by sounds or music. An incorrect response elicits a different sound. The four-year-old who played the game for me enjoyed the "incorrect" sound so much he would keep his finger on the button for at least three or four repetitions of the buzzer, but he was not at all computer sophisticated and I suspect this phenomenon would wear off quickly. After presentation of the shapes for identification, the program then uses the shapes to test for color recognition, again presenting three choices and asking for a joystick response.

The second game is a *Wordtest* that follows a format similar to the shapes test. After the child picks the correct spelling, he must remember it because the screen goes blank and he is asked to spell the word using the keyboard. Again, consider the ages of your children when reviewing the word list, realizing that the child must not only recognize, but also spell the correct answer. The 10 words are: cat, dog, man, car (pronounced "caaa" by the voice on the recorder with the distinct eastern accent), toy, boy, bird, girl, tree, and ball. The reward comes both after identifying the correct word, and after spelling it correctly. The child is given two chances to spell the word before the computer displays the proper spelling and moves on to another word.

Several times when I ran this program something happened — an error message appeared on the screen, or worse, the tape somehow got out of synchronization and the voice was asking the child to spell and identify a different word than the program was rewarding as correct. The intermittent nature of the problem precluded determining if this is a tape or equipment problem. This kind of error is very disconcerting to a young child. It was also disconcerting to me because the program must be started over. It's wise to record the approximate start position of the tape for each of the three programs. It's a credit to the author that this last type of problem does not occur more often, considering how many times the programs turn the recorder off and on for verbal instructions.

The third program is a *Count* test in which "magic keep-ing marbles" are dropped into a jar and the player is asked to record the number on the keyboard. The numbers range from one to 12. Again, for each correct answer the computer selects one of its reward picture /sound combinations to entertain the child. Incorrect answers are "buzzed." The player's marble count may not be entered until an okay sound is given. When I played the game I found the delay between the last marble falling into the jar and the go-ahead sound (to make my guess), too long. I frequently jumped the gun and the computer refused to recognize my response. I had to re-enter it. Figuring I was an adult and kids wouldn't be as fast, I watched carefully. Sure enough, when the kids knew the answer without counting, they did the same thing.

The instructions for the program are complete, the rewards colorful and reasonably interesting to the children for whom they were designed, and the concepts valid ones. Each program graphically scores the child's performance and gives a verbal reinforcement. The games do have their flaws. Only the buyer can answer the question of whether *Learning Games* suit his needs.

(DD Software, 10 Simonne Lane, Pepperell, MA 01463,
16K tape, \$24.95)

— Marty Sheldon



FLORIDA SEARCH NO LONGER!

The Software Connection of
Fort Lauderdale is your one stop source
for your Color Computer Software,
Peripherals, Books, Magazines & Repairs



THE SOFTWARE CONNECTION, INC.

4301 N. State Rd. 7
Lauderdale Lakes, FL 33319
(305) 484-7547

Good Guys And Bat Guys With *Fangman*

Most of us have seen Dracula die at least a dozen times in the late movies, but his departure is never permanent. He's back again in *Fangman*, an innovative creation of Tom Mix Software, but in a different role.

This time Dracula is the good guy! And since we're also good guys, we've got to help Dracula escape from the angry villagers who seek to do him harm.

They are like flies as they invade your castle, seemingly everywhere, seeking to destroy you by blocking your path with deadly crosses. The sun is their ally, wandering about the halls in a continuing effort to turn you into bones and dust.

Fortunately, you have allies of your own, the vampire bats that chase down the villagers and trap them until you arrive.

There are four levels of difficulty, ranging from 'Sucker' to 'I-V Leaguer'. The game is played in rounds, with a new screen for each round.

There also, for the English majors, are some of the best puns I've seen in a while to break up the monotony between screen changes. How about 'Fangs for the Memories,' 'Coffin Klatch,' 'Good Guys and Bat Guys,' and 'Little Brown Jugular'?

As with most of Tom Mix's games, the graphics and sound are good, the action continuous, and the level of challenge is consistently high. But the challenge is reasonable, and the more you play, the better you get — and the more fun you have.

You start the game with three lives, the number of which are shown at the lower left-hand part of the screen. If you turn all the villagers into bats before the bonus clock runs out, three things happen: You receive an extra life (up to 16 are possible), the number of points left on the clock are added to your score, and the number of villagers in the next round is increased by one. The more villagers there are, the longer the clock runs. The game ends when you run out of lives, of course.

A time-out feature is activated by pressing the 'T' key, freezing the characters. To unfreeze the action, just press the 'U' key. The high score is displayed constantly at the top of the screen, along with your current point total.

You have to be constantly alert while chasing the villagers because if they cross paths, they leave deadly crosses. I learned through experimentation that if you press your joystick button and wiggle the toggle switch around, Dracula will reverse in color and will be able to eliminate three of the crosses. This gives you many more chances to escape if the sun is bearing down on you.

When a villager is eliminated, he is transformed into a bat. When bats cross paths, coffins are created in the hallways. This is good news for you, Dracula, because they're worth 25 points each.

For the sheer fun of computer games, it would be difficult to match *Fangman*, although relatively few might offer better graphics and sound. On a contagious scale from one to 10, I would give *Fangman* a nine. This is one game that you will enjoy playing often.

(Tom Mix Software, 4285 Bradford N.E., Grand Rapids, MI. 49506, tape \$24.95, disk \$27.95.)

— Charles Springer

FOR GIRLS ONLY!

► An easy-to-use program in **high resolution color** that will attract little girls to computers.

THE DESIGNER: Create original clothes for a high-fashion model, using more than 1,000 style combinations in thousands of color and fabric options, or design your own original fabrics from textures, stripes and plaids in color combinations almost never seen on the Color Computer. The memory "closet" will hold up to 30 different outfits at once, so girls can save their favorites and show them off. Simple to use and an excellent manual is included.

Program requires 32K Extended Color Basic

Disk: \$24.95

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

COGNITIVE DEVELOPMENT CO.
fun things for the mind

Enclosed is my check for \$24.95 ☐

Charge my ☐ Visa or ☐ Mastercard

Card # _____ Exp. date: _____

Signature: _____

Suite 141A 12345 Lake City Way, NE
Seattle, WA 98125

QUESTION: Why buy a video game from a dinky little ad like this?

ANSWER: JUNGLE QUEEN has all 4 high-res screens (+ 4th screen intermission), & super sound. This 32k 100% ML game is just like the arcade!

TAPE-26.95 DISK-29.95/add 2\$post&hand
ZOSO SOFTWARE-6606 Skyway Dr.,
Columbus, OH 43229 *PS: Our 1st customers now will get big brakes later!

Color Stronghold — An Interesting Game Of Survival

It is always intriguing to attempt to figure out why and how a game was developed, as well as the more technical questions that come to mind as you play. The authors of *Color Stronghold* have come up with a neat way to attract your attention and "win you over" even before you play the game. The disk version of the game that is the subject of this review (it is also available on cassette) comes packaged in shrink wrap with a colorful picture of a "future man" holding a shield to defend his city from an onslaught of fiery meteors from outer space. On the other side of this picture are greetings from Larry Chow and Ken Olson, the game's authors. They tell you a little about themselves and how they came to develop the game. A strong clue to the game's strategy is provided when you are told that Larry is a war gamer. While Ken is an experienced assembly language programmer, *Color Stronghold* is Larry's first effort. The game was originally written for the Model 1/III/4 and then converted for the 32K CoCo. The disk itself is supplied in a colorful vinyl sleeve.

The game's premise is that a war almost destroyed civilization. The handful of survivors set up four colonies and shielded themselves from the radioactive debris that is still bombarding the earth. They have built a shield for each colony that acts as a "mobile energy catapult" that repels the debris.

Color Stronghold may be played with the arrow keys or joysticks. The number of players (two may play) is requested after loading the game. To use the joysticks for one player, the fire button on the right joystick is pushed; for two players to use the joysticks, the fire button on the left joystick is pushed; to use the arrows, either a '1' or '2' on the keyboard is pressed. You are then immediately confronted with the game action. The four corners of the screen each contain a city skyline (each one is different) that is surrounded with three walls of solid material. A saucer-shaped shield is positioned on the outside of each of the outer walls of the cities. If you selected a one-player mode, then you control the shield on the lower right-hand corner of the screen. The other three cities are defended by the computer. In a two-player game, the second player controls the shield for the city in the lower left-hand corner. The remaining two cities in a two-player game are defended by the computer. Both of the cities on the bottom of the screen have a box in them that keeps the player's score. There are two "balls" bouncing randomly around the screen that destroy small portions of any wall that they hit. The player moves the shield so as to deflect the balls before they hit one of the walls protecting the city. You score 10 points for each block of an opponent's wall that is destroyed. One may simply play defense and try to deflect the balls, or one may get into the game and catch the ball (this is done by holding down the fire button on the joystick as the ball hits the shield, or by holding the "/" down on the keyboard as the ball hits the shield) and attempt to destroy an opponent's city by "throwing" (releasing the fire button or the "/" the ball at the target. Throwing takes some getting used to because the ball goes in different directions depending upon where you are when you release it. Once all three layers of a city's walls

have been penetrated by the balls, a direct hit on one of the city's buildings by a ball will destroy the entire city, thus destroying you and all of its inhabitants. You are returned to the beginning screen where your score and the top score are recorded and you are requested to indicate whether one or two will play the next game. In a two-player game, the second player continues until defeated or until the computer's two cities are destroyed.

If the computer's three cities (one-player game) or two cities (two-player game) are destroyed, then the game moves on to the next level of play. If you were destroyed in a one-player game but the other player destroys both of the computer's cities, then you also get in play again as the game moves on to the next level. Your city and its walls are restored for the next level of play. The degree of difficulty and the interest level are increased as you go from one level to the next. The second level introduces a dragon that periodically moves across the screen between the upper and lower cities. He is destroyed by a direct hit by a ball and the source of the ball is awarded with extra points. A moving angle iron with a revolving cartwheel appears at the third level. The angle iron may be likened to the lower half of a "T" with one half of the top missing (a 90 degree angle). At the point where the bottom line intersects the top line of the angle iron, a revolving cartwheel (envision an "X" going around in a circle) catches a ball periodically and throws it randomly. The benefit of the angle iron is that it protects your city while it is moving over it and gives you a chance to rest. Speaking of resting, the game may be paused at any time by pressing the 'P' on the keyboard. When I say pause, that's as in "freeze." A ball that is on the way to hitting something just stops in midair. ENTER gets you going again. I wish I could tell you what neat things lay in store for those who get by the third level but my humility (and general lack of eye-hand coordination) doesn't allow me to discuss that.

If you want to end the game you are playing so that you can play with another person, you may abort the game by pressing the BREAK and CLEAR key at the same time. You are returned to the beginning screen where you select a two-player game.

The graphics employed in the game are extremely good. Blue, orange, white and black are used to make a very impressive playing field. The detail used in designing each city is obvious. Sound is used to give the atmosphere of arcade style action. Beeps and bongs are used to indicate hits of the ball by the shields and the balls on the cities' walls. The destruction of a city, the transition to the next level and the end of the game are each accompanied by an appropriate refrain. The degree of difficulty is about right — it's not so easy that you get bored and it's not so hard that you get frustrated. My 13-year-old daughter enjoys the game and will sit for long periods of time playing it.

The documentation consists of one 8½ x 11-inch page that gives briefly all of the information that is needed to play the game.

My daughter says that she enjoys *Color Stronghold* and that she would spend her own money to buy it. Her endorsement means more than mine, but for what it is worth, I also recommend it.

(MichTron, 576 S. Telegraph Road, Pontiac, MI 48053.
\$27.95 tape, \$29.95 disk)

— A. Buddy Hogan

Hayes Mach II Joystick Is A First-Class Performer

Hayes Products is now selling a really good joystick for the CoCo and other computers; it's the best one I've seen yet.

The Hayes Mach II uses a joystick mechanism not unlike the ones used in the transmitters for radio-controlled model planes and boats. It can be set up either for return-to-center operation (which many games, written for use with Atari-type joysticks, respond to best) or the non-return operation that the low-cost Radio Shack sticks use. You can even set up both sides of each axis for return, non-return or even lock one or more sides (a feature not covered in the instructions). There are two trimmer adjustments on top of the unit to set up the center position, compensating both for variations in the joystick and in the computer. There is one trigger button, placed so that your thumb lands on it when you hold the base in your left hand. (Left-handers may have some trouble with this stick.) There's a square space showing where a second button might be; the Apple and IBM versions have two buttons.

The Mach II has the best feel of any CoCo joystick I've seen. The stick moves easily, with a spring action (when used) that doesn't hinder movement. The button works well, also. The joystick is also very durable, and should hold up under even the toughest use. Overall, the Hayes Mach II is as good a value as any CoCo joystick.

(Spectrum Projects, Box 21272, Woodhaven, NY 11421 or Box 9866, San Jose, CA 95157-0866, \$39.95 plus \$3 S/H; manufactured by Hayes Projects, 1558 Osage Street, San Marcos, CA 92069)

— Ed Eilers

"Cooking With CoCo" Colin Stearman tells us that there is a problem with the schematic diagram for the EPROM programmer shown on Page 74 of the September issue. On the three 2764 EPROMs U4, U5 and U6 (U6 is actually the programming socket), data lines D0 through D7 are shown in reverse order. Here are the correct pin numbers:

D0 — 11	D4 — 16
D1 — 12	D5 — 17
D2 — 13	D6 — 18
D3 — 15	D7 — 19

Also, the +5 volt and ground (shown as 0V) lines on the two 6821 PIA chips are reversed: +5V should go to pin 20 and 0V to pin 1. Please note that all of the pins are marked with their function, *not* with the pin number. The chips are shown with the pins arranged as they are on the actual part; pin 1 is on the lower right (marked with a dot). This accounts for some of the wiring crossovers in the diagram.

There has also been some confusion over the listing in Part 3 on Page 79 of the September issue. A portion of the program drives a parallel interface which will be described in the December issue. Until this is built, you will need to delete Lines 466 through 470 and Lines 574 through 634. The programs on RAINBOW ON TAPE for October and November reflect these changes.

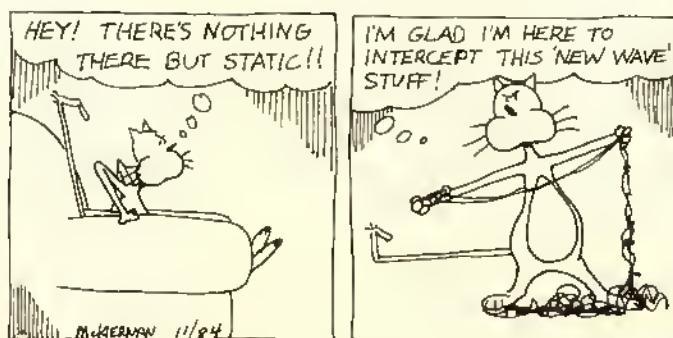
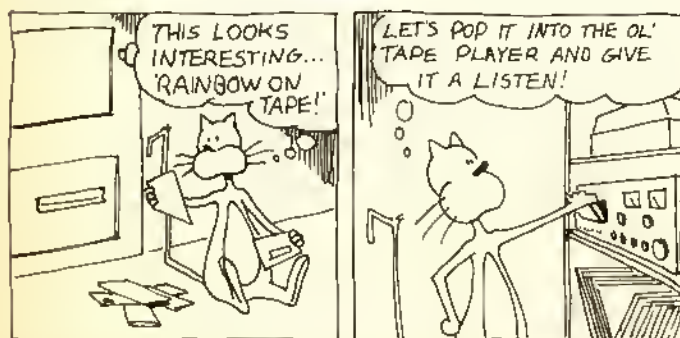
"The Jungle" (August, Page 18), there is a problem with keyboard response when using the new ROM (Color BASIC 1.2; do an *EXEC 41175* to see which one you have). Robert T. Rogers suggests adding one line to the program:

```
140 POKE 341,255:POKE 342,255:POKE
343,255:POKE 344,255
```

"Sopwith CoCo Flies Again" (August, Page 75), William G. Franklin tells us that there is a problem with errors in the course select read outs when using the 32K version. To fix this, change the correction factors shown in Line 1740 to add an extra digit of precision; .5729 becomes .57296, 5.729 becomes 5.7296 and 57.29 becomes 57.296.

"The Dragon's Gold" (August, Page 25), Charles Husak recommends that the number 254 in Lines 270 and 2850 be changed to 126.

CoCo Cat



The fifth of a six-part series.

Developing A Database Manager

By Bill Nolan
Rainbow Contributing Editor

As those of you who have been following this series know, we have been exploring direct access disk files and their use in a simple database manager program. We have been writing a mailing list program in this column that's as good as some commercial mailing list programs. So far, we have presented all of the program except the search and sort portions, and we will be adding the search in this column.

The program is written in a very modular style, with the various modules selected from a menu, or list of choices. When a program is written this way, you can test each subsection as though it were a small program by itself, and this makes program development proceed much more rapidly and smoothly. This is the reason you have been able to use the program to type in names and addresses, and then print these names and addresses on labels or in a phone number list even though two major

parts of the program are not yet included. As long as you avoided selecting search or sort on the menu, you were OK.

Before we get into the search section, we need to talk about *PCLEAR* for a moment. Line 10 of our program has a *GOTO 11000* in it, and Line 11000 is *PCLEAR:GOTO 20*. The *PCLEAR* statement tells the computer how many pages of graphics memory we are going to use. Each page of graphics memory uses about 1500 bytes of space, and since we won't be using any graphics memory, we want as few pages of graphics space cleared as possible. Your computer automatically clears four pages when you turn it on. Since we don't want four pages, we do a *PCLEAR1*. We would do a *PCLEAR0* if the computer allowed it, but that is not a legal command in BASIC.

If you have been running other programs in your computer, particularly those that use graphics, you may get an Illegal Function Call Error in 11000 when you run this program. The reason for this is that you cannot do a *PCLEAR1* if you are in a *PMODE* that requires more than one page of graphics space. If this happens to you, just type *PMODE0* and *RUN* the program again. If the problem persists, you may have a version of the ROM that is giving the

problem. In this event, just type *PCLEAR1* before running the program.

Now, on to the search section of our program. Searching is the process of going through a file looking for all of the records that contain certain things. For instance, you may want to find all of the people named Jones, or all of the people living in Ohio, or all of the people with a particular telephone prefix. The item you are searching for is called the target, and when you find the target in one of your records, that's called a match.

In our program, the search section is located starting at Line 3000 and continuing through 3550. This leaves the block of lines starting at 2000 open, and it is here that our sort section will go when it is added next month.

Line 3000 sets our flag to off (more later), clears the screen, and finds out if the user wants the matches on the screen or on labels. Line 3010 then prints a warning about the printer. (If I don't go over a particular subroutine, that means I have already done so in an earlier installment of this series.) Line 3020 finds out on which field the sort will be done (using the subroutine at 6500 that prints out all the field names). Remember, each piece of information, such as a name, an address, or a ZIP code, is a

(Bill Nolan, who teaches "Programming In BASIC" at the college level, owns Prickly-Pear Software Co. and has written several commercially successful software packages.)

field, and all of the information about one person is a record. All of the records together are a file.

Line 3030 finds out what the user is looking for (the target), and Line 3040 makes a branch to 3500 if they want the output on printer labels. If they didn't want the output on labels, the program will just go on to Line 3100. We actually have two different sorts then — one with the results going automatically onto labels (located at 3500 - 3550), and one with the results to the screen (located at 3100 to 3320). We will look at the shorter one (3500) first.

Line 3500 clears the screen, prints the message, "searching . . ." and executes the subroutine at 5500 to open the file. Line 3510 establishes a *FOR . . . NEXT* loop from one to the highest numbered record in our file. The *GET#* command will then get each record from the disk, put the information into an array in the subroutine at 7200, and then, in Line 3520, compare the proper item in the array to the target that was entered by the user. In doing the comparison, the *INSTR* function is used, so if the target is anywhere in the field we are searching, a match will occur. For example, a target of "Jo" will find both "Jones, Fred," and "Smith, John," because the target of capital "J" and lowercase "o" is found in both "Jones" and "John." (Watch out for upper- and lowercase letters — the computer thinks they are two different letters.)

If a match is found then the subroutine at 5000 will be used to print a label. This subroutine also sets our flag "FL=1" to on. Whether a match is found or not, Line 3530 completes the *FOR . . . NEXT* loop with a *NEXT X* (to check the next record), and when all records have been checked it closes the file. Line 3540 checks the condition of the variable FL. If this is equal to zero then we know that the program has not been to Line 5000, and since we do a *GOSUB 5000* whenever a match is found, this tells us that no matches were found and we print a message to that effect on the screen. In either case (matches found or matches not found), Line 3550 returns us to the main menu at Line 500.

As you can see, using this section of the program the output to the printer label is automatic, and the action is continuous until the entire file has been checked. As you will see in a moment, the section beginning at Line 3100 gives us more choices, but is not so automatic.

Line 3100 clears the screen and does a *GOSUB 5500* to open the file. Line 3110 sets up our searching loop, gets the first

record, and does a *GOSUB 7200* to put the information into an array. Line 3120 does the comparison of the proper field to the target, and if no match is found it branches to 3200 where it does a *NEXT X* and checks the next record. When all records have been checked, Line 3200 closes the file, Line 3210 checks the condition of our flag variable "FL" and prints our no matches found message if appropriate, and Line 3220 returns us to

apply, so at the end of the routine in Line 3180 we jump to 3200 and our *NEXT X*. The last choice the person had was to press 'C' and change the record. If they do this, Line 3160 will send them to a subroutine at Line 3300.

Line 3300 clears the screen, prints each field in the record with a number from one to six in front of it, and asks the user which piece of information they want to change. They will indicate their

"We have seen commercial programs that literally take days to sort because of disk access time, and many take overnight. Our sort, although it is in BASIC, will take just a few minutes for a full file."

the main menu at Line 500. So far, this is just about like the section we just talked about at Line 3500. The difference begins if a match is found.

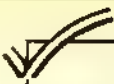
If a match occurs in Line 3120 then the program clears the screen and does a *GOSUB 5400*. At 5400 the flag is turned on (FL=1), and all six fields in the matched record are printed on the screen. Then, in Line 3130-3150, the user is given several choices. They may press 'P' to print this information on a label, press 'N' to go to the next item, press 'R' to return to the main menu at 500, press 'D' to delete this item, or press 'C' to make changes in this item. When the user presses one of these letters, Line 3160 will branch to the proper location to do what they have selected.

If they choose 'R', then it will *GOTO 3170* where the file is closed and a branch is made to the main menu at 500. If they choose 'P', then Line 3160 will do a *GOTO 3190*, and at 3190 we first branch to the subroutine at 5000 to print the label and then go back to 3120 to reprint the choices on the screen. Remember, the person may want to print this record, but then they may want to make one of the other choices. If they choose 'N', then 3160 will send them to Line 3195 where they will encounter first a short beep, and then a *NEXT X* to get the next record. If they choose 'D' to delete this record then Line 3160 will do a *GOTO 3180*. The routine at 3180 deletes the record by filling it with "up arrows." The reason for this will become apparent when we do our sort section next month. Since the record is deleted, no further choices

choice by pressing a key from one to six, and when they do that a message telling them which field they are changing will be printed on the screen (in Line 3310), and they will be asked to enter the new information. The *LINE INPUT* in Line 3320 accepts their new information, does a *GOSUB 7100* to *LSET* it, *PUTS* it on the disk, and goes back to Line 3120 where the list of choices will be presented again.

Well, that's about it for the search section. Our program is now complete except for the sort. The sort will have two functions. First, it will put the information in order by the field of your choice, so you will be able to have people in order by name, ZIP code, state, or however you choose. Second, it will compress the file by removing the deleted records completely. Our current delete leaves an empty record number. As we have been promising, you will like the sort. We have seen commercial programs that literally take days to sort because of disk access time, and many take overnight. Our sort, although it is in BASIC, will take just a few minutes for a full file. In fairness to the commercial programs, however, we must point out that it is the type of sort we are using that limits us to 400 records in a file, and if we allowed more records we would have to change our sort method.

Next month, in addition to the sort, we will have complete directions on how to operate this program. We have been giving these piecemeal, and so we will put them all in one place to make it a bit more convenient. Have a nice Thanksgiving.



560	.....	100
1200	....	185
3140	....	159
3540	....	154
4220	....	43
5150	....	134
END	....	36

The listing:

```

10 CLS:GOTO 11000
20 CLEAR 15000
30 DIM ST$(400),ST(400),R$(6)
40 PRINT:PRINT" WORK ON WHICH FI
LE?":INPUT F$:GOSUB 5500:CLOSE #
1
50 IF LR<1 THEN PRINT:PRINT" THI
S IS A NEW FILE":PRINT:PLAY"AB":
GOSUB 7000
60 CLS:PRINT:PRINT"DO YOU WANT L
BELS PRINTED?":PRINT:PRINT" 1. L
AST NAME FIRST":PRINT" 2. FIRST
NAME FIRST":PRINT:PRINT"PLEASE S
ELECT 1 OR 2":K$=INKEY$
70 K$=INKEY$:LC=VAL(K$):IF LC<1
OR LC>2 THEN 70 ELSE SOUND 150,1
500 CLS
80 PRINT:PRINT"                MAIN
MENU":PRINT:PRINT" 1. ADD RECOR
DS"
90 PRINT:PRINT" 2. SORT RECORD
S"
100 PRINT:PRINT" 3. SEARCH RECO
RDS"
110 PRINT:PRINT" 4. PRINT RECOR
DS"
120 PRINT:PRINT" 5. END PROGRAM
"
130 PRINT:PRINT" PLEASE ENTER YO
UR CHOICE (1-5)":K$=INKEY$
140 K$=INKEY$:K=VAL(K$):IF K<1 O
R K>5 THEN 140 ELSE SOUND 150,1
500 ON K GOTO 1000,2000,3000,400
0,10000
1000 CLS:GOSUB 5500:CLOSE #1:CR=
LR+1:PRINT" YOU ARE ADDING RECO
RD #":CR:PRINT" TO THE FILE ";F
$
1100 PRINT:PRINT"NAME (LAST NAME
, FIRST NAME)":LINE INPUT R$(1)
1200 PRINT:PRINT"ADDRESS?":LINE
INPUT R$(2)
1300 PRINT:PRINT"CITY? ";R$(3)
1400 PRINT:PRINT"STATE CODE? "
;R$(4)
1500 PRINT:PRINT"ZIP CODE? ";R
$(5)
1600 PRINT:PRINT"PHONE #? ";R$

```

```

(6)
1070 GOSUB 5500:GOSUB 7100:GOSUB
7200
1080 CLS:FOR X=1 TO 6
1090 PRINT:PRINTR$(X)
1100 NEXT X
1110 PRINT:GOSUB 7020
1120 IF K$="Y" THEN 1200
1130 CLOSE #1:CLS:PRINT:PRINT" F
IELD TO CHANGE?":GOSUB 6500
1140 CLS:PRINT:PRINT" OLD DATA I
S":PRINT:PRINTR$(CF):PRINT:PRINT" ENT
ER NEW DATA:":LINE INPUT R$(CF):
GOTO 1070
1200 PUT #1,CR:CLOSE #1:CLS
1210 PRINT:PRINT" WANT TO ADD MO
RE? (Y/N)":K$=INKEY$:GOSUB 7030
1220 IF K$="Y" THEN 1000 ELSE 50
0
3000 FL=0:CLS:PRINT:PRINT" DO YO
U WANT MATCHES SENT TO THE P
RINTER AUTOMATICALLY? (Y/N)
":K$=INKEY$:GOSUB 7030:KK$=K$
3010 PRINT:PRINT" IF YOU ARE SEN
DING OUTPUT TO THE PRINTER, B
E SURE IT IS READY AND ON L
INE.":PRINT:GOSUB 7000
3020 CLS:PRINT:PRINT"SEARCH ON W
HICH FIELD?":GOSUB 6500
3030 PRINT:PRINT"SEARCH FOR WHAT
?":LINE INPUT TG$:SOUND 150,1
3040 IF KK$="Y" THEN 3500
3100 CLS:GOSUB 5500
3110 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
3120 IF INSTR(1,R$(CF),TG$)=0 TH
EN 3200 ELSE CLS:GOSUB 7200:GOSU
B 5400
3130 PRINT:PRINT" (P)RINT LABEL,
(N)EXT ITEM, (R)ETURN TO MA
IN MENU, (D)ELETE, (C)H
ANGE)"

```

One-Liner Contest Winner . . .

This is a one line "guess the random number" program. CoCo will tell you to guess a number and it will tell you if you are high or low until you guess the correct number CoCo has in mind, or memory. CoCo will also tell you how many guesses it took for you to answer correctly. Just type in the program and RUN.

The listing:

```

0 CLS:PRINT:PRINT"I KNOW A NUMBE
R FROM 1-100":R=RND(-TIMER):R=RN
D(100):FORX=0TOISTEP0:PRINT:INPU
T"GUESS MY NUMBER":G:N=N+1:IFG=R
THENPRINT"YOU GOT IT IN"N"GUESS
ES!":ENDELSEIFG<R THENPRINT"TOO
LOW":NEXTELSEIFG>R THENPRINT"TOO
HIGH":NEXT

```

Rich Dersheimer

Amanillo, TX

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.)

```

3140 PRINT:PRINT" INDICATE YOUR
CHOICE":K$=INKEY$
3150 K$=INKEY$:IF K$="" THEN 315
0 ELSE IF INSTR(1,"RPNOC",K$)=0
THEN 3150
3160 ON INSTR(1,"RPNOC",K$) GOTO
3170,3190,3195,3180,3300
3170 SOUND150,1:CLOSE #1:GOTO 50
0
3180 SOUND 150,1:FOR Y=1 TO 6:R$
(Y)=STRING$(30,"^"):NEXT Y:GOSUB
7100:PUT#1,X:GOTO 3200
3190 GOSUB 5000:GOTO 3120
3195 SOUND 150,1
3200 NEXT X: CLOSE #1
3210 IF FL=0 THEN PRINT" NO MATC
HES FOUNO":GOSUB 7050
3220 GOTO 500
3300 SOUND 150,1:CLS:PRINT:FOR Y
=1 TO 6:PRINTLEFT$(STR$(Y),2);".
";R$(Y):NEXT Y:PRINT:PRINT" CHA
NGE WHICH FIELO? (1-6)":K$=INKEY
$
3310 K$=INKEY$:K=VAL(K$):IF K<1
OR K>6 THEN 3310 ELSE SOUND 150,
1:PRINT:PRINT" CHANGING FIELD #"
;K:PRINT:PRINT" INPUT NEW DATA:"
3320 LINE INPUT R$(K):SOUND 150,

```

```

1:GOSUB 7100:PUT #1,X:GOSUB 7200
:GOTO 3120
3500 CLS:PRINT:PRINT" SEARCHING.
..":GOSUB 5500
3510 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
3520 IF INSTR(1,R$(CF),TG$) THEN
GOSUB 7200:GOSUB 5000
3530 NEXT X:CLOSE #1
3540 IF FL=0 THEN PRINT" NO MATC
HES FOUNO":GOSUB 7050
3550 GOTO 500
4000 CLS:PRINT:PRINT" PRINT ALL
RECOROS SECTION"
4010 PRINT:PRINT" 1. PRINT ON S
CREEN":PRINT" 2. PRINT ON PRINT
ER":PRINT" 3. PRINT ON LABELS":
PRINT" 4. PRINT PHONE # LIST":P
RINT" 5. RETURN TO MAIN MENU":P
RINT:PRINT" PRESS A NUMBER (1-5
)":K$=INKEY$
4020 K$=INKEY$:PO=VAL(K$):IF PO<
1 OR PO>5 THEN 4020 ELSE SOUND 1
50,1
4030 ON PO GOTO 4100,4200,4100,4
300,500
4100 GOSUB 5500:CLS:IF PO=3 THEN
PLAY "COEF":PRINT" MAKE SURE PR

```

DATEBOOK & CALENDAR

- Tape or Disk files
- Index records by date, month, year, or day
- Prints date-to-date
- Encryption by password, Password is not stored

32k ECB \$25.95

RELATIONAL DATABASE

- Blistering fast sort, 1000 records in 10 sec OR LESS!
- Multikey sort
- Tape or Disk files
- Math ability

SASE for more info

32k ECB \$39.95

Butterfly Software

Rt 7 Box 565-A (806)
Lubbock, TX 79401 762-1941

Talk is Cheap!

your Color Computer can talk for only

\$29.95

SPEAK UP!™ is a machine language, voice synthesizer program for the TRS-80 Color Computer.* It is 100% software—nothing else to buy. Best of all, **YOU** can make BASIC programs talk!

- 16K, 32K, 64K all on one cassette
- Text-to-speech makes it easy to use
- **SPEAK UP!** will say anything
- Reviewed in April '83 Issue of *Rainbow*
- Reviewed in Oct. '83 *Color Computer*
- COD, VISA, MC, checks—no delay

ORDER NOW 800-334-0854 EXT. 890



Classical Computing, Inc.

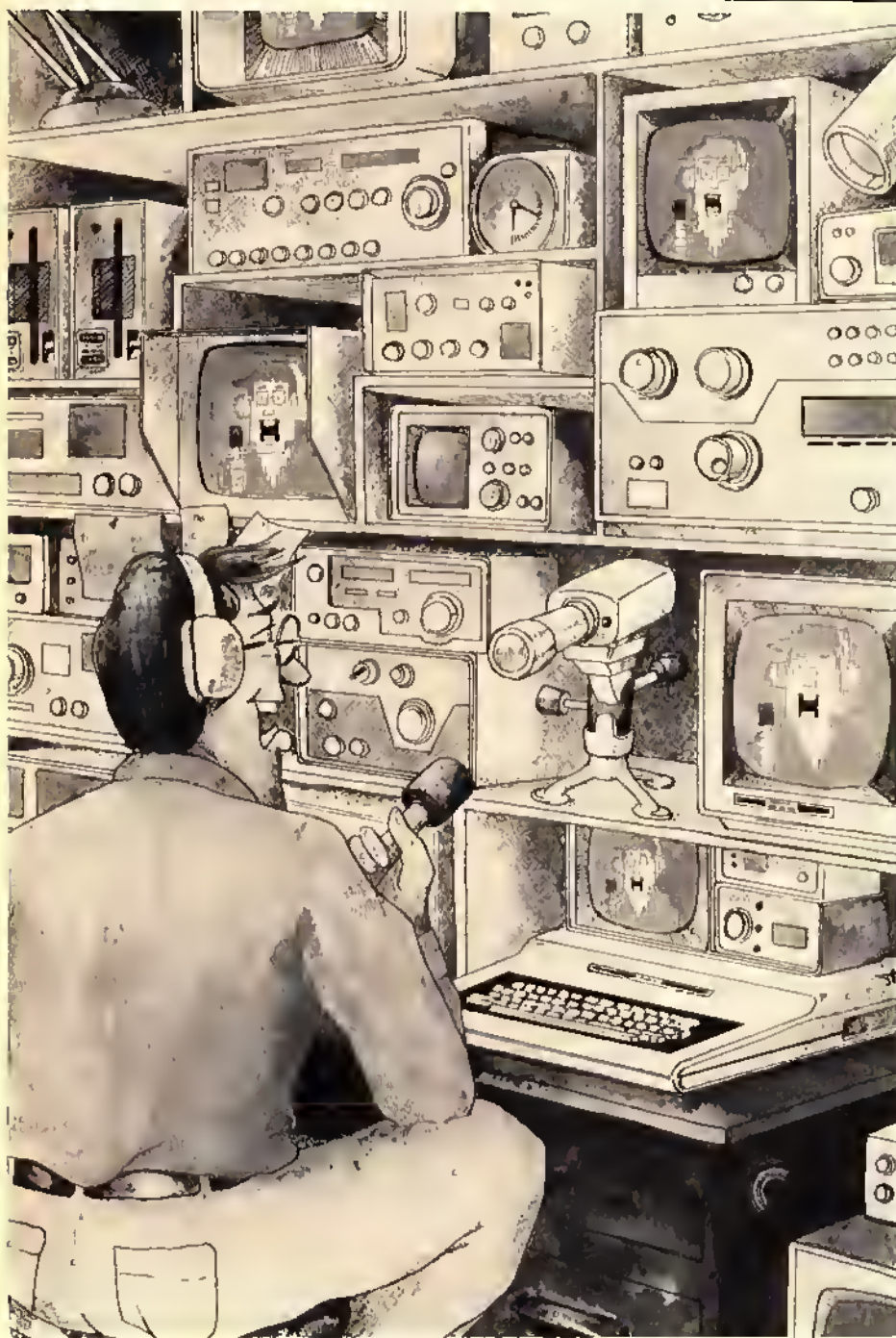
P.O. Box 3318
Chapel Hill, NC 27515

*TM by Tandy Corp.

Ham Radios And CoCos — A Great Combination

By Dan Downard

Rainbow Technical Editor



This month's theme is communications as you can see by our cover. I believe that a standard accessory in any ham shack today is a computer, and from the letters we receive quite a few are CoCos. As a ham operator (K4KWT), I think it would be appropriate to mention some of the CoCos uses in communications. I feel we owe the non-hams an explanation of what they are missing.

Computers and Ham Radio

I, for one, was introduced to computers via ham radio. If I may be a bit nostalgic, the days are not long past when I made the statement "Copy code with a machine? Impossible!" The first computer I had was an "Explorer 85" single-board system that had the total sum of 1K of RAM. The first thing I programmed it to do was send Morse Code. I could only send 0 through 9 and A through F as it only had a Hex keyboard, but what an accomplishment. Moving up to a 4K system with a 6800 microprocessor allowed me the luxury of receiving code. The 6800 system was purchased at a local "hamfest" and a homemade terminal was remarkably similar to the modern Color Computer, 6847 VDG and all.

Communications

You can not only send and receive Morse code, Slow-Scan TV, RTTY, ASCH and Facsimile with a CoCo, but perform a myriad of technical tasks. My transceiver has the facility of remote tuning and operation from a computer via a serial interface. Another dream I used to have was operation of the ham

(Dan Downard is an electrical engineer and has been involved in electronics for 24 years through ham radio (K4KWT). His interest in computers began about five years ago and he has built several 68XX systems.)

```

INTER AND LABELS ARE SET UP A
NO ON LINE":GOSUB 7050
4110 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
4120 IF PO=1 THEN GOSUB 5300 ELS
E GOSUB 5000
4130 NEXT X
4140 CLOSE #1:GOTO 4000
4200 GOSUB 5500:PLAY"CDEF":PRINT
" MAKE SURE PRINTER IS ON LINE":
GOSUB 7050
4210 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
4220 PRINT#-2,R$(1);" ";R$(2):P
RINT#-2,R$(3);" ";R$(4);" ";R$
(5);" ";R$(6):PRINT#-2,""
4230 NEXT X
4240 CLOSE #1:GOTO 4000
4300 GOSUB 5500:PLAY"CDEF":PRINT
" MAKE SURE PRINTER IS ON LINE":
GOSUB 7050
4310 FOR X=1 TO LR:GET #1,X:GOSU
B 7200
4320 PRINT#-2,R$(1);" ";R$(6)
4330 NEXT X
4340 CLOSE #1:GOTO 4000
5000 FL=1:IF LC=2 THEN GOSUB 510
0
5010 FOR Y=LEN(R$(3)) TO 1 STEP
-1
5020 IF MID$(R$(3),Y,1)<>" " THE
N 5040
5030 NEXT Y
5040 R$(3)=LEFT$(R$(3),Y)
5050 PRINT#-2,R$(1):PRINT#-2,R$(
2):PRINT#-2,R$(3);" ";R$(4);"
";R$(5)
5060 FOR Y=1 TO 3:PRINT#-2,"":NE
XT Y:RETURN
5100 P=INSTR(1,R$(1),","):IF P=0
THEN RETURN
5110 N1%=RIGHT$(R$(1),30-(P+1)):
N2%=LEFT$(R$(1),P-1)
5120 FOR Y=LEN(N1%) TO 1 STEP -1
5130 IF MID$(N1%,Y,1)<>" " THEN
5150
5140 NEXT Y
5150 N1%=LEFT$(N1%,Y):R$(1)=N1%+
" "+N2%:RETURN
5300 CLS:PRINT:PRINT" RECORD #"
;X:PRINT:FOR Y=1 TO 6:PRINTR$(Y)
:NEXT Y:PRINT:GOSUB 7000:RETURN
5400 FL=1:FOR Y=1 TO 6:PRINT R$(
Y):NEXT Y:PRINT:RETURN
5500 OPEN"D",#1,F$,99
5510 FIELO #1,30 AS N$,30 AS A$,
15 AS C$,2 AS S$,9 AS Z$,13 AS P
$
5520 LR=LOF(1):RETURN

```

```

6500 PRINT:PRINT" 1. NAME":PRINT
" 2. ADDRESS":PRINT" 3. CITY":PR
INT" 4. STATE":PRINT" 5. ZIP COO
E":PRINT" 6. PHONE #":PRINT
6510 PRINT" PRESS A NUMBER (1-6)
":K$=INKEY$
6520 K$=INKEY$:CF=VAL(K$):IF CF<
1 OR CF>6 THEN 6520 ELSE SOUND 1
50,1:RETURN
7000 K$=INKEY$:PRINT" PRESS AN
Y KEY TO CONTINUE"
7010 IF INKEY$="" THEN 7010 ELSE
SOUND 150,1:RETURN
7020 PRINT" IS THIS CORRECT? (Y/
N)":K$=INKEY$
7030 K$=INKEY$:IF K$<>"Y" AND K$
<>"N" THEN 7030 ELSE SOUND 150,1
:RETURN
7050 FOR X=1 TO 2000:NEXT X:RETU
RN
7100 LSET N%=R$(1):LSET A%=R$(2)
:LSET C%=R$(3):LSET S%=R$(4):LSE
T Z%=R$(5):LSET P%=R$(6):RETURN
7200 R$(1)=N$:R$(2)=A$:R$(3)=C$:
R$(4)=S$:R$(5)=Z$:R$(6)=P%:RETU
RN
10000 CLS:UNLOAD:END
11000 PCLEAR1:GOTO 20

```

BASIC COMPILER

Convert Machine Language Programs from Basic Programs

There's right, with this powerful Integer Compiler, called **INTBASIC**, you can translate Basic programs to Machine Language. Those who do not want to learn Assembly Language can use this utility program to create those last machine language programs away, without programming or creating. Even fully compliant Assembly Language programs will load **INTBASIC** a very suitable utility. **INTBASIC** was designed specifically to produce efficient 6800 machine code by utilizing the powerful instruction set available.

INTBASIC, developed by **WASATCHWARE**, features all standard Basic commands including two-dimensional arrays, multiple commands per line and strings. In addition, **INTBASIC** offers commands that are not available with Color or Extended Color Basic. All 64k of RAM can be used for program storage and/or available storage, and all 32k of ROM can be accessed within the a.s. program. Compiled programs can be called from a Basic program, thus making translating easy.

INTBASIC has many features that some of the lower priced Basic Compilers don't offer. Here are just some of them:

- No Disk system is required, although it can use from disk
- Extended Color Basic is NOT required
- Exceeds the full 64k of RAM to be used
- 16k machines can run **INTBASIC**

In addition, **INTBASIC** is written in Machine language, not Basic. This means that compile times are very short. How short? **INTBASIC** can compile a 10 thousand byte Machine Language program to an object in 30 seconds!

Some other reasons to buy **INTBASIC**

- By converting Basic programs to machine language, program execution times are decreased by a factor of 50!
- Machine Language programs can perform many things that a Basic program cannot do. Unlimited possibilities exist when using machine language.
- Variable storage is efficiently allocated, and therefore large arrays may be used. For example, the integer array A(20000) is allowable on 64k machines.
- Even those one program can handle as many as 100,000. As opposed to Basic which only allows one program at a time to the computer.
- System utility programs can be easily developed using **INTBASIC**.
- Machine language programs that take pages and pages of Assembly Language sources to create, can be created with less than a page of a compatible Basic program, when compiled with **INTBASIC**.
- Versions for 16,32 and 64k computers are all included for the same low price.

DON'T HESITATE...BUY **INTBASIC** TODAY

Versions for the Color Computer II are available. Please specify computer type (I or II).

TAPE- \$39.95

Utah res. add 5% tax.

Add \$3.00 Shipping & Handling
Checks or Money Orders (No C.O.D.)



WASATCHWARE
7350 Nuttree Drive
Salt Lake City, Utah
84121
Call (801) 943-6263

station from a remote location, such as at work during my lunch break. Just call home, punch a couple of tones on the telephone Touch-Tone pad that would activate the receiver, and see what new DX (foreign) countries were on the air today. It's no longer a dream, and the systems get more sophisticated with each new generation of radios. By the way, almost all ham transceivers use microprocessors for control these days. The possibilities are unlimited.

The CoCo is a natural for communications. Not only do we have one of the most advanced microprocessors on the market, the 6809, but built-in serial I/O, A/D, D/A and expansion capabilities.

Programs are available that send and receive CW, RTTY, ASCII and Slow-Scan TV just by inputting audio from your receiver to the cassette (A/D) port on your CoCo. They lack the selectivity of the elaborate filtering networks used in some commercial communications equipment, but they work. If you have a friend who is a ham, ask him to give you a demonstration of Slow-Scan TV. Imagine receiving a picture from as far away as Japan with a radio receiver and a CoCo, and talking to the operator on the other end at the same time. The

technology for this communications mode has been around for awhile, but computers are making it affordable for anyone.

A new horizon of computer applications in ham radio is called "packet radio." High speed messages are being relayed from station to station using CoCos. The 6809 is the standard micro for several packet schemes. In the future, an entire system of repeaters will allow any ham to send a message across the country activating each repeater automatically until the message reaches its destination.

On a local scale, repeaters have controllers using CoCos, allowing phone calls using a hand-held walkie-talkie. These frequencies are also used to exchange information nightly on CoCos. Ham bulletin boards, or mail boxes, differ only due to the fact that radios are used instead of modems and telephone lines.

Operator Aids

One of the things I enjoy is contests. The object of contests is to see how many other stations you can contact in a specified amount of time, whether it be in foreign countries, or maybe different

states. What did I do without my CoCo? Elaborate cross-reference (dupe) sheets were designed so that you would not talk to the same station twice, wasting valuable time and points. Maybe in one weekend you would talk to as many as 1,000 other hams. Now it is as simple as typing in the other station's call letters. Not only will your CoCo check for dupes, but print an entire log of your contacts in a few minutes, a chore that used to take days.

For the everyday operator, CoCo databases allow instant retrieval of information on the ham you are talking to, whether the DX station is a new country, and what your antenna heading should be for a particular country. Your CoCo will even design your next antenna for you.

What's Next?

I guess you can sum the computerists and ham radio operators in the same quote, whose author I don't recall. "The difference between men and boys is the price of their toys." We're boys, and girls, with expensive toys. I would also like to think of us as young Thomas Edisons at the threshold of a new discovery or invention.

The **KEY-264K** is here!!

DO YOU HAVE A 64K SYSTEM (DR 32K WITH 64K MEMORY CHIPS) ?? ARE YOU BEING TOLD YOU CAN ONLY USE 32K FROM BASIC ??

DON'T BELIEVE IT !! - KEY COLOR SOFTWARE brings you the KEY-264K. An exciting NEW SOFTWARE utility that allows any STANDARD 64K DR 32K COLOR COMPUTER TO ACCESS 64K RAM FROM BASIC, and with NO HARDWARE MODIFICATIONS REQUIRED!!

*** Works with CASSETTE based systems! ***

The KEY-264K divides the 64K ram memory into two 32K banks or sides, each of which can be utilized independently by the BASIC interpreter, with the ability to switch instantly from one side to the other. IT'S LIKE HAVING TWO COMPUTERS IN ONE!! Have your BASIC program on one side and keep your variables on the other side, or have your main program on one side and your subroutines on the other side, or have your program on one side and use the other side for 4 additional HI-RES pages, or any combination you like. The possibilities are endless because the KEY-264K allows full communication between sides plus the ability to switch back and forth at will, all from within BASIC. You could also have different programs in each side and switch back and forth between them using simple keystrokes, even while the programs are running!! Or run them both at the same time in the FOREGROUND/BACKGROUND MULTI-TASKING mode. Don't buy that printer buffer yet! With the KEY-264K you can be printing in the background side while utilizing your computer normally in the foreground side AT THE SAME TIME!!! Debugging a program? Use either a BASIC command or simple keystrokes to instantly duplicate your program, in its present status, on the opposite side. Switch to the opposite side later and pick up exactly where you were before!

For DISK users, the KEY-264K allows you to alternate between DISK and EXTENDED BASIC on the same side with simple keystrokes. No need to pull your controller or power down. You can be in EXTENDED BASIC on one side and in DISK BASIC on the other side and still switch back and forth and have full communications between the two sides.

The KEY-264K does this and MORE thru extensions to BASIC. No need to learn a new language! The KEY-264K adds 15 NEW COMMANDS and 1 function to BASIC, including powerful new BLOCK MEMORY MOVE and GRAPHICS VIEWING commands.

The KEY-264K works on the 64K COCO or 64K COCO-2 and on older 32K systems with "E", "F", or even modified "D" boards and requires EXTENDED or DISK BASIC with GOOD 64K MEMORY CHIPS!

ORDER YOUR KEY-264K TODAY by sending check or money order for \$39.95 (cassette) or \$44.95 (disk) plus \$2.00 postage U.S.A. (\$5.00 outside U.S.A.) Mass. residents add 5% sales tax.

MASTERCARD, VISA, OR COD
CALL (617) 779-5034

KEY COLOR SOFTWARE
P.O. BOX 360
HARVARD, MA. 01451



The 'System' And Its Important Procedures

By Michael Plog, Ph.D.
Rainbow Contributing Editor

In computer jargon, the word "system" probably has more definitions than any other single word. Different people use the same term, yet mean different things. I have heard computer salespeople talk about their system by describing a set of hardware components. Likewise, software vendors will describe a set of programs as a system. The description of an educational computer system needs to be more inclusive than either of these two examples.

To avoid confusion, let's understand the definitions. If you disagree with my use of the term, then simply go through the article and write your preferred term in place of "system." My dictionary defines system as "... an assemblage or combination of things or parts forming a complex or unitary whole." For educational computer use, a system should include three parts: hardware, software, and procedures. All three must fit together to make a single entity, which can properly be called a system.

First, an educational computer system has to have a hardware configura-

tion. That could be as simple as a Color Computer with a single tape drive, or as complex as several computers sharing a hard disk drive. No matter how complex or simple, you cannot have a system without some sort of hardware. Hardware considerations are important when designing a system, and become essential when using the system. The hardware must fit the job to be completed.

Second, an educational system must have software. Without software, the machinery is nothing more than some very complex electronic components. For right now, we will ignore the difficulties caused by any differences between software, firmware, operating system, etc. We can safely lump all items together under some concept of "giving instructions to the machine" and call that software.

Third, a system must have a set of procedures to govern the operation. In my opinion, this is the most important part of any system.

Consider for a moment a computer system developed to keep track of student grades. If the clerical staff never updates the records, the entire venture is worthless. School officials will never be able to get accurate student grades from the computer. Procedures of such a system must include timely updates and

things like backups and formats of paper records to accompany electronic records.

The concept of procedures of a computer system go much further than this simple example. A complete computer system can impact on many operations of a school (or business, home, hobby, etc.). For example, teachers will need to have a specific time limit for giving grade updates to the people who operate the computer. If the updates are not delivered on time, the system is still worthless — it will not produce the desired results for school officials.

Someone somewhere has possibly outlined all the necessary criteria for procedures of a computer system. I have not seen such an outline. No such outline will be presented here. Instead, we will concentrate on a few aspects uniquely connected with an educational system.

Training is essential for any successful implementation of a computer system. Training on the equipment is necessary, but not sufficient. Teachers need to know how to operate computers, but beyond that, teachers need to be taught the importance of computers in the classroom.

This is no easy task. We are talking about training in such areas as attitudes, behaviors, and even emotional ap-

(Michael Plog received his Ph.D. degree from the University of Illinois. He has taught social studies in high school, worked in a central office of a school district, and currently is employed at the Illinois State Board of Education.)

proaches to dealing with situations. The task of teacher training is the school administrations' responsibility, as well as the responsibility of the unofficial educational leaders (usually from the ranks of teachers) found in any school setting. No matter how it is done, the final outcome must be that teachers understand how a computer can be important in their classrooms. This is a crucial part of the procedures of an educational computer system.

Another important aspect of system procedures is the incorporation of computers in classrooms. Assume that a significant number of teachers have a good understanding of the importance of computers. Assume further that machines and selected software are available to these classrooms. The task (part of the overall procedures of the system) remains as to how to incorporate computers in the educational experiences of students.

I recently heard about a school that implemented computers in classrooms last school year. Each teacher was assigned a computer for two weeks. At the end of that time, the computer moved on to another classroom and teacher.

From the report I received, some teachers were elated at the prospect of having a computer, if just for a short time. Some teachers, however, found this to be disruptive to the learning process and generally disappointing. About the time that the students (and the teacher) discovered how to operate the machine, it was removed.

Now, it may be that the school the administration wanted all students to have some exposure to computers, with a more intensive implementation to occur that particular school year. Possibly, the administration received some computers and wanted to distribute time on the machines in a "fair" manner. It is also possible that the administration had no idea what to do with the computers, and were on a "fishing trip" — (Let some teachers figure out what can be done with the machines, then tell everyone else). I do not know what the administration had planned, or what the goals of this example were. Therefore, I cannot pass judgment on the experience. There are, however, a few rules that should be followed in incorporation procedures.

One major rule for incorporation

procedures is to have as little disruption of the normal classroom activities as possible. Disruption only causes negative attitudes about educational uses of computers, which must be corrected before successful implementation can occur.

Another "rule of thumb" is that computer incorporation in a classroom can be achieved more smoothly if consideration is given to the material being covered. If teachers can be shown that the same material can be covered more easily using computers, they will be much more likely to assist the incorporation process.

Both of these rules recognize the importance of the teacher in the incorporation process. Without cooperation from teachers, administrators will never be able to fully implement an educational computer system. Likewise, without administrative support, computer use in schools will be only a fragmented approach — a true integrated system of several parts will be impossible.

If you have any reactions you wish to share, please write me at 829 Evergreen, Chatham, IL 62629.

Printer Art!

Turn your printer into an artist with this delightful package of four 16K Extended Basic programs! The pictures on this page are just a sample of the fun in store for you, your family or classroom. Printer Artist introduces you to the craft of "Artying," the creation of pictures using typewritten characters. The package includes a dozen ready-to-run drawings of animals, people, patriotic scenes, famous Americans and more. There are instructions for an additional 40 pictures you can create with two different utility programs that will allow you to set up a file of printer art and save it to tape or disk. Our manual includes a complete discussion of printer art programming techniques. It's a good way to learn typing skills, too. Works with any 80-column printer. Only \$24.95 on tape, \$27.95 on disk. Add \$1.50 for postage and handling. See our ad on the following page for other fine programs from Federal Hill Software.

Federal Hill Software 825 William St. Baltimore, Md. 21230 301-685-6254 VISA/MC Welcome

Helping Youngsters Develop Their Dictionary Skills

By Steve Blyn
Rainbow Contributing Editor

This is the age of information gathering. Although the computer has presented us with new databases to help obtain information, students still need to know how to use the traditional sources of information—the dictionary and the encyclopedia.

It seems that students need to gather more and more information for the same subject each year. New discoveries, inventions, and vocabulary keep cropping up in most subject areas. Therefore, extra knowledge is continually needed to master each field of study.

One of the important skills needed to gather information is to be able to use a dictionary or encyclopedia correctly. Speed is often an important consideration in locating a word or a topic. To aid in quickly locating the word or subject needed, guide words are provided in almost all dictionaries and encyclopedias.

At the top of the pages of these reference books are the guide words. These two words indicate the first and last

words covered on that page. Some reference books for younger learners pair the guide words on two pages. There is then only one guide word per page. The top left of the left-hand page contains the first entry on the two pages and the top right of the right-hand page contains the last entry covered.

In either case, any word that falls alphabetically between the two guide words will be included on that page or

“Children are often embarrassed to admit that they really have never noticed the words at the top of the page or truly don’t know how to use them.”

(Steve Blyn teaches both exceptional and gifted children, holds two master’s degrees and has won awards for the design of programs to aid the handicapped. He and his wife, Cheryl, own Computer Island.)

two pages. Words that come alphabetically before the first guide word will be found on a previous page and words that fall alphabetically after the second guide word will be found on a subsequent page.

I have seen too many students spend inordinate amounts of time in trying to locate the word they were looking up. Their time would be much better spent in researching the information they were seeking.

Children are often embarrassed to admit that they really have never noticed the words at the top of the page or truly don’t know how to use them. We, as parents and teachers, should, therefore, make an effort to teach this necessary skill. We should not make the mistake of assuming that the student knows how to use the guide words.

This month’s program drills students in the use of guide words. The guide words of four pages from a popular dictionary are presented. A word that is located on one of the pages is shown. The student should enter the correct page number on which this word can be found. At the end of the session, a report on the number of correct answers is given.

There are 10 words and page numbers in the *DATA* lines. You may, of course, add more examples to make the program more challenging. The number of examples is represented by the variable *L* in Line 60. Change the *L* value in Line 60 and the dimension statements in Line 70 to correspond to the number of words you wish to use.

Federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC-10

Mon CoCo Parle Francais! Mi Coco Habla Espanol!

These delightful 16K Extended Basic programs will teach your youngsters a basic French or Spanish vocabulary. Each language package contains two programs with a total of 1,000 words in a colorful game format that teaches children to think as well as memorize. They'll have great fun as they watch the letters hop across the screen and slip into place. Perfect for home or classroom. We include a list of the vocabulary words for study guides or lesson plans. Spanish or French, only \$24.95 on tape, \$27.95 on disk. Both languages only \$39.95, tape or disk.



The Handicapper

Use the power of your computer to improve your performance at the track! Separate programs for harness and thoroughbred horses make it a snap to rank the horses in each race! Using information readily available from the thoroughbred Racing Form or harness track program, you can handicap a race in five minutes and a whole card in less than an hour! We even provide diagrams showing where to get the information you need.

Factors include speed, class, post position, past performance, jockey or driver's record, weight, parked out signs, beaten favorite and other attributes. Complete instructions and betting guide. Versions for all Color Computers, MC-10's and Model 100's. State computer type and memory when ordering. Harness or thoroughbred, \$27.95 each, tape or disk.

NEW GREYHOUND HANDICAPPER! Now use your Color Computer for greyhounds, too! This fine handicapping program, written by a successful greyhound trainer, does it all. Using speed, breaking ability, favorite box, kennel performance, and other factors, it ranks the dogs in each race and recommends quinnella, trifecta and exacta bets. For Color Computer only, \$27.95 tape or disk.

SPECIAL! Any two handicappers, only \$39.95. All three only \$54.95.

Tax Relief!

Were your taxes a hassle this year? Then you need Coco-Accountant II. This 32/64K home and small business accounting program is everything you need to keep track of your finances and make income tax time a breeze. Use your canceled checks, credit card receipts, payroll and bank stubs. Coco-Accountant II will list and total expenditures by year, month, account and payee or income source. It tracks tax deductible expenses and payments subjects to sales tax. It even calculates the sales tax you paid.

The program offsets income and expenditures to produce net cash flow reports. It prints out a spreadsheet showing your year at a glance, balances your checkbook and prints a monthly reconciliation statement. The 32K version handles 450 entries in RAM. The 32K disk version stores 500, while the 64K tape and disk versions store an amazing 900 entries. State memory size when ordering. Only \$27.95, tape or disk.

Pigskin Predictions!

Tired of wrestling with those NFL point spreads? Let Pigskin Predictions do the work! This best-selling NFL handicapper predicts the outcome of each game for any week in the season. Easy once-a-week entry of scores makes it a snap!

Pigskin Predictions offers menu-driven selections of schedules, ratings, division races, predictions or results by team or week. Seven different reports to screen or printer. Saves data to tape or disk for weekly updates. It calculates projected won-lost records and point spreads for all weeks, maintains home field advantage and power ratings for all teams and includes 1984 schedule and up-to-date score data.

You'll be amazed at the power of this program! Programs for 16 and 32K included on tape, 32K only on disk. Just \$35.95 on tape or disk. 1984 data tape or disk for previous owners only \$13.95.



Federal Hill Software

FINE PRODUCTS FOR THE COLOR COMPUTER, DRAGON AND MC-10



We accept checks, money orders or Visa/MasterCard. Credit card orders should include card number, exp. date and signature. Add \$1.50 per order for shipping and handling. Be sure to specify tape or disk where applicable.

825 William St. Baltimore, Md. 21230 301-685-6254

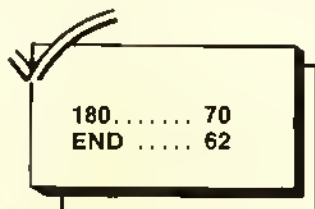
A\$ represents the word and *B* represents the page number. *B* is not a string because it only contains numeric data. The *DATA* is at the end of the program. Add as many additional *DATA* statements as you indicated in the dimension statements above. You may continue on the existing *DATA* Line 350 or begin your own in Line 360.

Lines 110-150 contain the guide words for our four sample pages. These too, may easily be modified to your purposes by replacing them with your own guide word examples.

Lines 170-210 contain a routine for randomizing the *DATA* and presenting

it in a non-repeating format. These lines will continue to function correctly without change as you increase or alter the *DATA*.

We hope that you will use this program to help increase someone's research skills. As always, please feel free to modify the program to your and the children's needs.



The listing:

```
10 REM"STEVE BLYN"
20 REM"COMPUTER ISLAND,NY,1984
30 CLEAR 1000
40 Z=RND(-TIMER):'***RANDOMIZE
50 S$=STRING$(32,239):'*** MAGEN
  TA LINE
60 J=0:L=10:G=0
70 DIMA$(L),B$(L):'*** ALTERABLE
  TO THE NUMBER OF WORDS USED
80 FOR S= 1 TO 10:READA$(S),B$(S)
  :NEXT S
90 CLS0:PRINT07,"using guide wor
```

```
ds";
100 PRINT032,S$;
110 PRINTTAB(6)"SAMPLE PAGES":PR
  INT S$;
120 PRINT"      GLACIER      290    GL
  ASS"
130 PRINT"      GLASSINE     291    GL
  IDER"
140 PRINT"      GLIM         292    GL
  ORY"
150 PRINT"      GLOSS        293    GL
  UT"
160 PRINTS$;
170 FOR X=1 TO 10:N(X)=X:NEXT X
180 R=RND(L):T=N(R)
190 N(R)=N(L):L=L-1
200 PRINT0320,STRING$(160,12B);
210 IF L<0THEN GOTO 300
220 J=J+1:PRINT091,"#";J;
230 PRINT0288,"THE WORD ...";A$(
  T);"... CAN BE"
240 PRINT"FOUND ON PAGE NUMBER .
  ..";:INPUT C
250 IF C=B(T) THEN PRINT0394,"CO
  RRECT";:G=G+1:SOUND240,3:GOTO270
260 IF C<>B(T) THEN SOUND40,2:PR
  INT0384,"SORRY,THE ANSWER IS PAG
  E ";B(T)
270 PRINT0452,"press <enter> to
  go on";
280 EN$=INKEY$
290 IF EN$=CHR$(13) THEN 180 ELS
  E 280
300 FOR T=200 TO 255 STEP 5:SOUN
  DT,2:NEXT T
310 PRINT0288,"YOU GOT"0"CORRECT
  THIS TIME."
320 PRINT:PRINT"PRESS a TO GO AO
  AIN OR e TO END.";
330 AN$=INKEY$
340 IF AN$="A" THEN RUN ELSE IF
  AN$="E" THEN END ELSE 330
350 DATA GLAD,290,GLEE,291,OLINT
  ,292,OLOVE,293,GLOW,293,GLOOM,29
  2,GLEAM,291,GLAND,290,GLIB,291,O
  LITTER,292
```

EDUCATIONAL SOFTWARE

COINS

\$24.95

Counting coins, adding coins and making change. 3 skill levels each. Summary after every five problems. High res. graphics.

ADDITION

\$24.95

8 levels-coeputer adjusts to student. Easy-to-read large nuebers. Error correction and printable summary. Easy to use.

TIC-TAC

\$24.95

Answer (+,-,X) problems to win tic-tac-toe squares. 3 time limits and incorrect answers gives the computer the square.

TEXT

\$24.95

Text writing for young children. large readable letters. Movable cursor for easy editing. 3 screens of text. Save/load/print

ALL PRDGRAMS DN CASSETTE

MINIMUM DF 16K EXTENDED BASIC

\$24.95 EACH / 4 FDR \$89.95

ADD \$1.00 PDSTAGE AND HANDLING

RI RESIDENTS ADD 6% SALES TAX

SEND CHECK DR MDNEY DRDER TD;

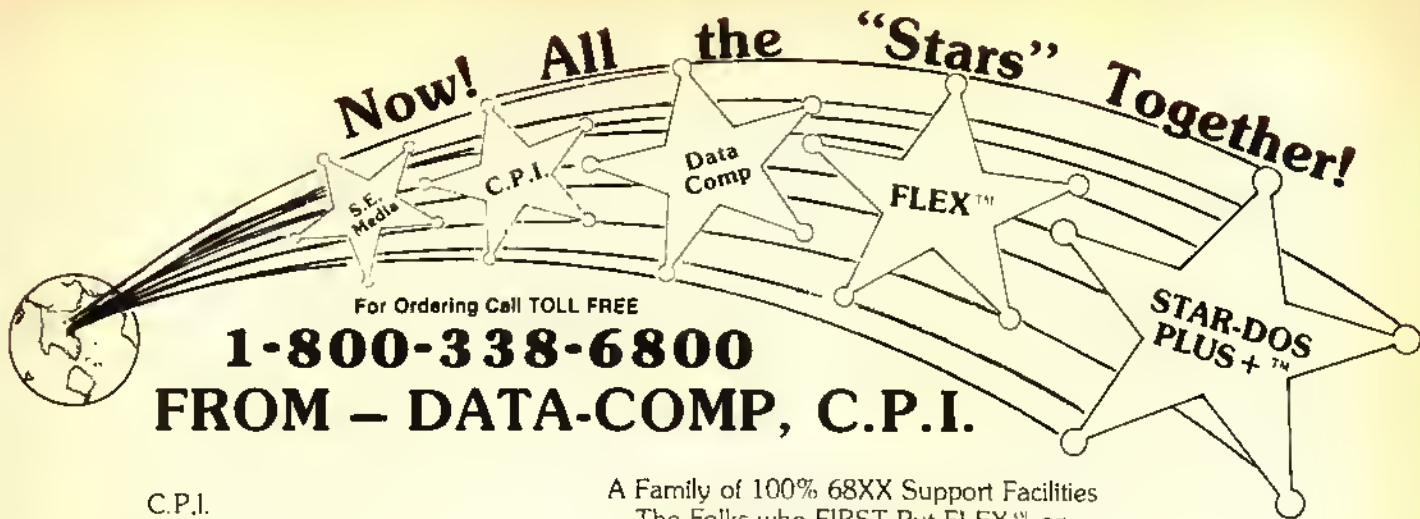
WISH SOFTWARE

P.O. BOX 7366

JOHNSTON, RI 02919

(401) 232-2707





C.P.I.
Color Micro Journal
'68' Micro Journal
Data-Comp
S.E. Media

A Family of 100% 68XX Support Facilities
The Folks who FIRST Put FLEX™ on
The CoCo
Now Offering: *FLEX™ (2 Versions)
AND *STAR-DOS PLUS+™

FLEX-CoCo Sr.
with TSC Editor
TSC Assembler
Complete with Manuals
Reg. '250.00' **Only '79.00'**

STAR-DOS PLUS+
• Functions Same as FLEX
• Reads - writes FLEX Disks
• Run FLEX Programs
• Just type: Run "STAR-DOS"
• Over 300 utilities & programs
to choose from. **'34.50**

FLEX-CoCo Jr.
without TSC
Editor & Assembler
'49.00

PLUS

ALL VERSIONS OF FLEX & STAR-DOS+ INCLUDE

TSC Editor
Reg \$50.00
NOW \$35.00

- + Read-Write-Dir RS Disk
- + Run RS Basic from Both
- + More Free Utilities
- + Super 800 Support
- + Free Color Micro Journal 1 yr. sub.

- + External Terminal Program
- + Test Disk Program
- + Disk Examine & Repair Program
- + Memory Examine Program
- + Many Many More!!!

TSC Assembler
Reg \$50.00
NOW \$35.00

DISK SYSTEMS FOR THE COLOR COMPUTER

THESE PACKAGES INCLUDE DRIVE, *CONTROLLER,
POWER SUPPLY & CABINET, CABLE, AND MANUAL.

* SPECIFY WHAT CONTROLLER YOU WANT J&M, OR RADIO SHACK.

PAK #1 - 1 SINGLE SIDED, DOUBLE DENSITY SYS.	\$389.95
PAK #2 - 2 SINGLE SIDED, DOUBLE DENSITY SYS.	\$639.95
PAK #3 - 1 DOUBLE SIDED, DOUBLE DENSITY SYS.	\$439.95
PAK #4 - 2 DOUBLE SIDED, DOUBLE DENSITY SYS.	\$699.95
PAK #5 - 2 DOUBLE SIDED, DOUBLE DENSITY SYS. THINLINE DRIVES, HALF SIZE	\$659.95

COLOR COMPUTER II 64K W/EXT. BASIC \$189.95

CONTROLLERS

J&M DISK CONTROLLER W/ JDDs OR RADIO SHACK
DISK BASIC, SPECIFY WHAT DISK BASIC. \$139.95

RADIO SHACK DISK CONTROLLER 1.1 \$134.95

DISK DRIVE CABLES

CABLE FOR ONE DRIVE \$19.95
CABLE FOR TWO DRIVES \$24.95

MISC

64K UPGRADE W/MOD. INSTRUCTIONS,
C,D,E,F, AND COCO 2 \$49.95

HJL KEYBOARDS	\$69.95
MICRO TECH LOWER CASE ROM ADAPTER	\$74.95
RADIO SHACK BASIC 1.2	\$29.95
RADIO SHACK DISK BASIC 1.1	\$29.95
RADIO SHACK EXT. BASIC	\$39.95
SCREEN CLEAN CLEARS UP VIDEO DISTORTION	\$39.95
MEMOREX DISKS 5" 55,DD	\$24.00
SHIPPING INCLUDED ON DISK PRICES	
DISK DRIVE CABINET & POWER SUPPLY	\$49.95
SINGLE SIDED, DOUBLE DENSITY 5" DISK DRIVE	\$199.95
DOUBLE SIDED, DOUBLE DENSITY 5" DISK DRIVE	\$249.95

PRINTERS

EPSON RX-80	\$325.00
EPSON RX-80FT	\$375.00
EPSON MX-100	\$690.00
EPSON FX-100	\$799.00
EPSON FX-80	\$549.00
EPSON MX-70	\$200.00

SERIAL BOARDS FOR PRINTERS

MX-SERIES	\$119.95
FX-SERIES	\$99.95

USA ADD 2% SHIPPING
FOREIGN ADD 5% SHIPPING

5900 Cassandra Smith Rd. Hixson, TN 37343
TEL. (615) 842-4600 • TELEX 558 414 PVT BTH

*FLEX is a Trademark of Technical System Consultants
*STAR DOS+ is a Trademark of STAR-Kits & Data-Comp

NEW DISK DRIVES

STARTING AT

\$159.00

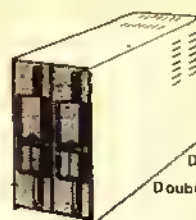
**WITH CASE &
POWER SUPPLY
\$189.95**



TANDON MPI TEAC

Speed 6 ms tk to tk and up
Capacity 250k unformatted
Tracks 40
Warranty **now 1 YEAR**

New Low Price!



40Tks 6Ms
Double Sided
Double Density

1/2 Hght. Teac/Panasonic



We carry only the finest quality disk drives • no seconds • no surplus

SATISFACTION GUARANTEED!!

ALL DRIVES FULLY TESTED & WARRANTED

- Complete Disk Drive with Power Supply & Case \$189.95
- Two Drives in Dual Case & Power Supply ~~\$359.00~~ Call
- 1/2 ht double sided double density Disk Drives (Panasonic/Teac) ~~\$219.95~~ Sale
- 1/2 ht double sided double density Disk Drive with ps & case ~~\$249.95~~ Sale



How to use your new drive system on audio cassette

Single ps & case ...\$44.95 Dual ps & case \$79.95

Color Computer Controller (J&M)

\$129.95

DRIVE 0 FOR RADIO SHACK COLOR COMPUTER

TANDON, MPI OR TEAC DRIVE (SINGLE SIDED 40 TRACKS SPEED 5MS TRK TO TRK & UP)
POWER SUPPLY and CASE, TWO DRIVE CABLE WITH ALL GOLD CONNECTORS

J&M CONTROLLER, MANUAL and DOCUMENTATION ~~\$329.95~~ **\$ SALE!**

DRIVE 0 FOR RADIO SHACK COLOR COMPUTER

PANASONIC 1/2 HEIGHT DOUBLE SIDED DOUBLE DENSITY DRIVE 500K unformatted
POWER SUPPLY and CASE, 2 DRIVE CABLE WITH ALL GOLD CONNECTORS

J&M CONTROLLER, MANUAL and DOCUMENTATION ~~\$399.95~~ **Super!! SALE!**

TAKE ADDED SAVINGS ON TWO DRIVE SYSTEMS

DISKETTES with free library case \$17.95

Unadvertised Specials \$Call

Drives cleaned, aligned & tested \$29.95

TECHNICAL STAFF ON DUTY PLEASE CALL FOR ASSISTANCE.



**CALL US TODAY!!
ORDER TOLL FREE**

**(617) 234-7047
1-800-635-0300**

* DEALER INQUIRIES INVITED.
(617) 234-7047





TRUE DATA PRODUCTS

195 Linwood Street, P.O. Box 546
Linwood, Massachusetts 01525
(617) 234-7047

HOURS MON-SAT 9-6 (EST)

We welcome

- Visa / Master Charge  
- Checks (allow 2 weeks for clearing)
- C.O.D. Add \$2.00

The DEVICE DRIVER

By *STEVE DEN BESTE*

It should not surprise anyone that the new Radio Shack Deluxe RS-232 Program Pak (referred to in the rest of this article as "the RS-232 Pak") can be made to work with the Multi-Pak Interface and OS-9. Unfortunately, as I write this, Radio Shack hasn't acknowledged this. This article presents a driver that allows you to use the RS-232 Pak with OS-9.

To use it, type in the driver listing and assemble it. Then type in the device descriptor and assemble it. These must be in separate files. To actually use them it is necessary to build a new operating system using *OS9GEN*, then use *DSAVE* to copy all the operating system files onto it. Once the device is installed in OS-9, you may access it as *"/TT."* The RS-232 Pak must be in slot three of the Multi-Pak Interface.

(Steve Den Beste has been a professional software engineer for eight years. He previously developed microprocessor software for Tektronix, and now works for Test Systems Strategies, a start-up engineering company. He boasts of owning "the most stacked CoCo on earth.")

The RS-232 Pak possesses a Synertek 6551 ACIA. This Asynchronous Communication Interface Adaptor has a built-in Baud rate generator and other nifty things. The interrupt line from the 6551 is hooked to the *CART* line on the cartridge connector, which in turn can be hooked to the *FIRQ* line of the 6809. This driver, as a result, is interrupt driven. I have found that when I have a friend on the remote port, both he and I can type to interactive programs (like the editor) and neither notices that the other is there unless one of us accesses the disk.

The driver itself is heavily adapted from an example device driver given in the Microware OS-9 System Programmer's guide.

As given in this article, the Baud rate for the port is set by *XMODE* (or power up defaults) before the device is ever used. Using *TMODE* to change Baud will have no effect on the Baud rate. In order to change the Baud rate you have to reboot your system, and use *XMODE* to change the Baud rate before ever sending or receiving anything from it. This is caused by the way that OS-9 uses the various entries in the device driver.

The "parity" setting in the *TMODE*

and *XMODE* commands is actually used for two things. It is bit encoded as follows:

Bit 6,5 = 00 - 8 bits per word
 01 - 7 bits per word
 10 - 6 bits per word
 11 - 5 bits per word

Bit 2,1,0 = 000 - No Parity
 001 - Odd Parity
 011 - Even Parity
 101 - Mark Parity
 110 - Space Parity

Despite the way the bits are set in the *MOD* command, this driver is *not* re-entrant. It is using a fixed location in low memory to keep a pointer to its scratch memory. This is necessary so that the interrupt driver can find it.

For those of you that don't want to type these programs in, and don't mind paying the phone bill, you may call (503) 641-0879 through October and log in as *"DRIVER."* This system is up and enabled for dial-up use when I am not using it. I wish to thank Rick Bensene for invaluable technical assistance, Dave Skinner for the loan of the 7D02 and Stan Dolson for moral support.



Heat Up Your COCO With J&M'S *Hot* Disk Controller

Upgrade your COCO by adding JDOS advanced disk operating system, top quality disk drive, and **VIP-Writer***, a powerful word processor.

J&M Systems offers this package for a remarkably low price that gives you a plug-compatible disk drive for both the original COCO and the COCO-2.

Gold contacts assure reliability, built-in digital phase locked loop means NO adjustments, and disc operations are supported by JDOS. The controller also supports RS DOS, FLEX*, and OS/9*.

JDOS implements all RS DOS Basic commands, plus many more, including Auto line numbering, DOS to boot OS/9, and RUNM to load and run machine language programs.

You may also choose to format disks 40 track (single or double side) as well as 35 track RS compatible. Up and Down arrow keys support scrolling: a feature everyone wants!

VIP-Writer, gold-edged JFD DISK CONTROLLER card, JDOS in ROM, complete drive, cable, and Manuals: all for only \$379.

J&M SYSTEMS:

The Driving Force For Your Color Computer!

*VIP-Writer is a registered trademark of Soft Law

*FLEX is a registered trademark of Technical Systems Consultants, Inc.

*OS/9 is a registered trademark of Microware, Inc.

To Order Fill Out This Coupon or Call 505/265-1501

_____ I'd like more information on these products:

_____ PLEASE SEND ME: A top-quality complete SSDD 180K disk drive with cable, a gold-edged JFD Disk Controller card (JDOS in ROM), VIP-WRITER word processing program, and manuals all for only \$379.

Name _____

Address _____

City/State/Zip _____

_____ I WANT TO USE VISA® OR MASTERCARD®

Card # _____ Exp. Date _____

Signature _____

_____ Enclosed is my check or money order.

J & M SYSTEMS, LTD.

137 UTAH NE • ALBUQUERQUE, N.M. 87108 • 505/265-1501

The listing:

NAM RS6551

```
*
* Device Driver for the RS Deluxe RS232 Pak
*
*   By Steven Den Beate
*
* (Heavily adapted from an example SCF-type device driver
* given in the Microware OS-9 System Programmer Guide)
*
```

```
* The next IFP1 looks like this:
*
```

```
* ifp1
* use /d0/defs/os9defs
* use /d0/defs/scidefa
* IT.BAU EQU $27
* IT.PAR EQU $26
* endc
*
```

```
ifp1
use /d0/defs/os9defs
use /d0/defs/acidefa
IT.BAU EQU $27
IT.PAR EQU $26
endc
```

TTL Driver for the RS Deluxe RS232 Program Pak

```
INPS12 aet 100 input buffer SIZE (<=256)
OUTS12 aet 40 output buffer SIZE (<=256)
```

* Static storage offsets

*

ORG V.SCF room for SCF variables

```
INXT1 RMB 1 input buffer NEXT-IN ptr
INXT0 RMB 1 input buffer NEXT-OUT ptr
ONXT1 RMB 1 output buffer NEXT-IN ptr
ONXT0 RMB 1 output buffer NEXT-OUT ptr
INPBUF RMB INPS12 input buffer
OUTBUF RMB OUTS12 output buffer
SCRATCH RMB 1 Scratch location
STATUS RMB 1 Scratch=hardware status
```

MODMEM EQU . TOTAL STATIC STORAGE REQUIREMENT

* MODULE HEADER

MODBEGIN EQU *

MOD MODENO,MODNAM,DRVR+OBJECT,REENT+1,MODEMT,MODMEM
* Note that this is NOT a reentrant module, sigh.

FCB UPDAT.

MODNAM FCB "RS6551"

fcv 1 edition number

MODEMT LBRA INIT

LBRA READ

LBRA WRITE

LBRA BETSTA

LBRA PUTSTA

LBRA TRMNAT

* MEMPTR is a location in low memory that is
* not used by OS9. It is used to point to the
* "device memory area" passed to this driver
* when it is installed. MEMPTR is needed so
* so that the interrupt handler can find this
* area.

MEMPTR EQU \$110

* BAUTAB - used to translate baud rates from
* the XMODE/TMODE commands into the hardware settings
BAUTAB FCB \$13,\$16,\$17,\$1B,\$1A,\$1C,\$1E,\$1F

* The following are offsets from the base address
* of the hardware

HTDATA EQU 0 Transmit data register

HRDATA EQU 0 Receive data register

HRESET EQU 1 Reset the 6551 (when written)

HSTAT EQU 1 Status of the 6551 (when read)

HCOMMAND EQU 2 Command register of the 6551 (R/W)

MCONTROL EQU 3 Control register of the 6551 (R/W)

pag

* INIT

* Initialize the 6551.

*

* On entry, U points to the device memory area

* Y points to the device descriptor

*

*

INIT EQU *

BTU MEMPTR

* Init buffer pointers

CLRA

CLRB

STD INXT1,U

STD ONXT1,U

```

* Initialize Multipak addressing
LDA #$23
STA $FF9F

* Set up the 6551 CONTROL register
LDA IT.BAU,Y User's baud rate
LEAX BAUDTAB,PCR
LDB A,X Translate to hardware baud rate
LDA IT.PAR,Y
ANDA #$60
STA SCRATCH,U
ORB SCRATCH,U Add in the word length
LDX V.PORT,U
STA HRESET,X Soft RESET the 6551
STB HCONTROL,X

* Set up 6551 COMMAND register
LDA IT.PAR,Y
ANDA #7
LSLA
LSLA
LSLA
LSLA
ORA #$05 Enable all chip interrupts
STA HCOMMAND,X

* Set up the FIRQ routine vector
LEAX FIRQHAND,PCR
STX $126
LDA #$7E A JMP instruction
STA $125

* Set up PIA to handle FIRQ from the CART line
LDA #$35
STA $FF23

* Enable FIRQ and clear CARRY
ANDCC #$BE

* Ship a byte to prime the output interrupt
LDX V.PORT,U
CLRB
STB HTDATA,X
RTS

```

```

*****
* READ
* return ONE BYTE of input from the 6551
*
* PASSED: (Y)=PATH DESCRIPTOR
*          (U)=STATIC STORAGE address
* returns: (A)=input BYTE (carry clear)
*          or CC=SET, B=ERROR code if error
*
READ00 BSR ACSLEP wait for acia data
READ LDB INXT0,U (input buffer) NEXT-OUT ptr
LEAX INPBUF,U address of input buffer

```

```

ORCC #FIRQ calm interrupts
CMPB INXT1,U any data AVAILABLE?
BEQ READ00 ..No; wait, and retry
ABX
LDA HRDATA,X Set the char
INCB ADVANCE NEXT-OUT ptr
CMPB #INPS1Z-1 end of circular buffer?
BLS READ10 ..No
CLRB reset ptr to start of buffer
READ10 STB INXT0,U save updated Buffer ptr
CLRB
LDB V.ERR,U Transmission error?
BEQ READ90 ..No; return
STB PD.ERR,Y return error bits in PD
CLR V.ERR,U
CONB return carry set
LDB #E$RD signal read error
READ90 ANDCC #$FF-FIRQ Enable FIRQ
RTS

```

```

*****
* ACSLEP - Sleep for I/O activity
* This version HOGS CPU if signal pending
*
* Passed: (cc)=IRQ's MUST be disabled
*          (U)=Global Storage
*          V.BUSY,U=current proc id
* Destroys: possibly PC
ACSLEP PSHS D,X
LDA V.BUSY,U get current process id
STA V.WAKE,U arrange wake up signal
ANDCC #$FF-FIRQ interrupts ok now
LDX #0
OS? F$SLEP wait for input data
LDX D.PROC
LDB P$SIGN,X signal present?
beq ACSL90 ..No; return
cnpb #S$INTR Deadly signal?
bls ACSLER ..Yes; return error
ACSL90 CLRB clear carry
PULS D,X,PC return

```

```

ACSLER LEAS 6,S Exit to caller's caller
CONA return carry set
RTS

```

```

*****
* WRITE
* WRITE char to 6551
*
* PASSED: (A)=char to write
*          (Y)=PATH DESCRIPTOR
*          (U)=STATIC STORAGE address
* returns: CC=SET IF BUSY (output buffer FULL)
*
NR1T00 BSR ACSLEP sleep a bit
NR1T LEAX OUTBUF,U output buffer address
LDB ONXT1,U (output) NEXT-OUT ptr
ABX

```



```

STA HTDATA,X PUT char in buffer
INCB ADVANCE the ptr
CMPB #OUTSIZ-1 end of circular buffer?
BLS WRIT10 ..No
CLRB reset ptr to start of buffer
WRIT10 ORCC #FIR0M disable interrupts
CMPB ONXT0,U buffer FULL?
BEQ WRIT00 ..Yes; sleep and retry
STB ONXT1,U save updated NEXT-IN ptr
LDX V.PORT,U
LDA HCOMMAND,X
ANDA #F3
ORA #04 Enable output interrupt
STA HCOMMAND,X
ANDCC #FF-FIR0M enable FIR0
WRIT90 CLRB (return carry clear)
RTS

```

```

* GETSTA/PUTSTA
* GET/PUT 6551 STATUS
*
* PASSED: (A)=STATUS CODE
*          (Y)=PATH DESCRIPTOR
*          (U)=STATIC STORAGE address
* returns: varies

```

```

GETSTA CMPA #SS.READY READY STATUS?
BNE GETS10 ..No
LDA INXT0,U
SUBA INXT1,U any data AVAILABLE?
BNE WRIT90 ..Yes; return carry clear
COMB
LDB #E0NRDY
RTS

```

```

GETS10 CMPA #SS.EOF End of file?
BEQ WRIT90 ..Yes; Return carry clear

```

```

PUTSTA COMB return carry set
LDB #E0USVC UNKNOWN SERVICE CODE
RTS

```

```

* TRMNAT
* TERMINATE 6551 processing
*
* PASSED: (U)=STATIC STORAGE
* returns: NOTHING
*
TRMN00 BSR ACSLEP wait for I/O activity
TRMNAT LDX D.PROC
LDA P0ID,X
STA V.BUSY,U
STA V.LPRC,U
LDB ONXT1,U
ORCC #FIR0M disable interrupts
CMPB ONXT0,U output done?
BEQ TRMN00 ..No; sleep a bit
LEAX TRAP,PCR
STX #126

```

RTS

```

* FIR0HAND
*
* This guy is called directly by the FIR0 vector
*
* All registers contain things from the background
* and all must be preserved by this routine
* but the FIR0 automatically saves CC
*

```

```

FIR0HAND PSMS D,X,Y,U
LDU NENPTR
LDX V.PORT,U Find the hardware
LDA #FF22 Strobe the PIA to clear FIR0
LDA HSTAT,X Get 6551 status.
STA STATUS,U Save for second check
BITA #0B Recvd char waiting?
BEQ FIR010
BSR IN6551
FIR010 LDA STATUS,U
BITA #010 Transmit ready?
BEQ FIR020
BSR OUT6551
firq20 PULS D,X,Y,U
TRAP RT1

```

```

* OUT6551

```

The ORACLE II

The Ultimate CoCo Monitor.



The ORACLE II is not a rehashed monitor program adapted to the CoCo, but a state of the art monitor designed to compliment the CoCo and its unique abilities.

Compare some of our features:

- 64K Compatible - the ORACLE II can relocate itself and its monitor screen above disk basic.
- Single Stepper - a single variable speed stepper that allows you to step both rom and ram.
- Disassembler -
- Graphics Support - allows you to step a program while watching any graphic screen, in any graphic mode, and toggle between the monitor screen and back, with one key.
- ASCII/hex search-up to a 10 byte search.
- Full screen display and editing of memory.
- Over 40 commands.

CoCo disk or tape (both versions included) \$35.95
Spectral or FHL Flex version 45.95
(+ \$2.00 shipping and handling)



MICRO MAGIC

P.O. BOX 142, SUMNER, WA 98390
(206) 863-8762
(24 Hours)



VISA

```

* Interrupt handler for output
*
* PASSED: (A)=6551 STATUS REGISTER CONTENTS
*         (X)=6551 port address
*         (U)=Memory area address
*
OUT6551 LEAY OUTBUF,U output buffer ptr
LDB DNXTD,U (output) NEXT-OUT ptr
CNPB ONXTI,U output buffer already empty?
BEQ OUTEMPTY ..Yes; disable output IRQ, return
CLRA
LDA D,Y next output char
INCB ADVANCE NEXT-OUT ptr
CNPB #OUTSI2-1 end of circular buffer?
BLS OUTI0 ..No
CLRB
OUTI0 STB DNXTD,U save updated NEXT-OUT ptr
STA HTDATA,X WRITE the char
CNPB ONXTI,U last char in output buffer?
BNE WAKEUP ..No
OUTEMPTY LDA HCONMAND,X Get value of command register
ANDA #$F3
ORA #$0B TR DN, TR INT disabled
STA HCONMAND,X

WAKEUP LDB #S$NAKE NAKE UP SIGNAL
LDA V.NAKE,U DNNER WAITING?
WAKEI0 BEQ WAKE90 ..No; return
DS9 F$SEND
WAKE90 CLR V.NAKE,U
RTS

```

```

*****
* IN6551
* process 6551 input INTERRUPT
*
* PASSED: (A)=STATUS REGISTER data
*         (X)=6551 port address
*         (U)=Memory area address
*
* NOTICE the ABSENCE of ERROR CHECKING HERE
*
IN6551 LDA HRDATA,X READ input char
LEAX INPBUF,U input buffer
LDB INXTI,U (input) NEXT-IN ptr
ABX
STA 0,X save char in buffer
INCB update NEXT-IN ptr
CNPB #INPSI2-1 end of circular buffer?
BLS IN2 ..No
CLRB
IN2 CNPB INXTD,U input OVERRUN?
BNE IN25 ..No; good
LDB #$20 mark overrun error
DRB V.ERR,U
STB V.ERR,U
BRA IN26 throw away character
IN25 STB INXTI,U update NEXT-IN ptr
IN26 ANDA #$7F

```

```

BEQ WAKEUP ..pass nulls without ctl checking
CNPA V.PCHR,U PAUSE char?
BNE IN3 ..No
LDX V.DEV2,U PAUSE DEVICE STATIC
BEQ WAKEUP ..None
STA V.PAUS,X REQUEST PAUSE
BRA WAKEUP

```

```

IN3 LDB #S$INTR INTERRUPT SIGNAL
CNPA V.INTR,U keyboard INTERRUPT SIGNAL?
BEQ IN4 ..Yes
LDB #S$ABT ABORT SIGNAL
CNPA V.QUIT,U keyboard ABORT SIGNAL?
BNE WAKEUP ..No
IN4 LDA V.LPRC,U last process ID
BRA WAKEI0 SEND ERROR SIGNAL

```

```

NDDCRC EQU *
mod Module CRC

```

```

MODEND EQU *

```

```

MDD TTEND,TTNAME,$FI,$BI,TTNCR,TTDRV
FCB 03 NDDE
FCB 255 24-bit device address (FF[HEX] if not used!)
FDB $FF6B
FCB TTNAME--1
FCB 0 SCF device

```

```

FCB 0 Upper and lower case
FCB 1 Video BACKSPACE
FCB 0 -BSL
FCB 1 ECHO
FCB 1 Auto-linefeed
FCB 0 No nulls at CR
FCB 1 Pause enabled
FCB 16 Lines per page
FCB $0B Backspace character
FCB $1B Delete line
FCB $0D End of record
FCB $1B End of file
FCB $04 Reprint line
FCB $01 Duplicate last line
FCB $17 Pause
FCB $03 Abort (Interrupt)
FCB $05 Quit
FCB $0B Back space echo
FCB $07 Line overflow echo
FCB $25 Parity=0, 7 data bits
FCB $01 300 Baud
FDB TTNAME OFFSET TO ECHO DEVICE
TTNAME FCS "T?"
TTDRV FCS "RS6551"
TTNCR FCS "SCF"
ENDD
TTEND EQU *

```



NEW!

For TRS-80 Color Computers

Children's Tales

*An Interactive Reading Skills Educational Tutorial***GREAT
GIFT FOR
CHRISTMAS!**

Children, ages 4-11

can experience the centuries-old enjoyment of fairy tales and nursery rhymes with the magic of today's technology now with this new Dorsett Talk/Tutor reading skills program. Mother Goose, Aesop's Fables, The Great Pyramids. These and many other favorite stories are brought to life in full color for the education and entertainment of your children. Easy words and colorful, high-resolution visual effects combine with professional narration to hold your children's interest while eliciting frequent participation. Most responses are multiple-choice, although there may be occasional opportunities for typed responses, with the option for by-pass. Remedial first-order branching is also available. It's all designed to give your children hours of entertainment while they enjoy learning new reading skills. Call our toll free number to order today.

There are 8 cassettes in this 16-program series. One cassette has a half-hour program on each side. The cost is \$6.80 per cassette. The complete 16-program series is only \$59.90.



Little Miss Muffet
sat on a tuffet.

What do you think a tuffet is?

- 1 bed
- 2 stool
- 3 dish

Sample frame from Children's Tales, a reading skills series

CHILDREN'S TALES READING SKILLS SERIES

- | | |
|---|--|
| <p>CT 1 Mother Goose—"Hey Diddle, Diddle," "Jack and Jill," and other rhymes make using the computer fun while we learn; for ages 4-7.</p> <p>CT 2 More Mother Goose—"Little Boy Blue," "Little Miss Muffet," and other rhymes give us more enjoyment while we learn; for ages 4-7.</p> <p>CT 3 The Three Little Kittens—"had lost their mittens..." and we have more fun while we find them; for ages 4-7.</p> <p>CT 4 The Three Bears—"Great Big Bear, Middle-sized Bear, and Wee Little Bear" find a surprise in their house when they come home; for ages 4-7.</p> <p>CT 5 Aesop's Fables—Aesop was a slave who lived in Greece and told wonderful stories; "The Country Mouse and the City Mouse," "The Tortoise and the Hare," and others; for ages 4-7.</p> <p>CT 6 A Child's Garden of Verses—Robert Louis Stevenson wrote a number of cherished rhymes; "The Land of Nod," and others; for ages 4-7.</p> <p>CT 7 Cinderella—Poor Cinderella is treated like a slave by her step-mother and step-sisters, until she meets her Fairy Godmother; for ages 6-9.</p> <p>CT 8 Alice in Wonderland—A modern adaptation of Lewis Carroll's "Adventures of Alice," where Alice goes shopping with her father and has some incredible experiences; for ages 6-9.</p> | <p>CT 9 The Emperor's New Clothes—The Emperor has some very unusual clothes which everyone would like to see; for ages 6-9.</p> <p>CT 10 The Ugly Duckling—The Ugly Duckling is bitten by the ducks, chased by the chickens, and even disliked by the turkeys until one day when something special happens; for ages 6-9.</p> <p>CT 11 The Frog Prince—A beautiful princess loses a golden ball, is forced to be friends with an ugly frog, and gets a great big surprise; for ages 6-9.</p> <p>CT 12 Sleeping Beauty—Twelve fairies give wonderful gifts to the new princess, but the Thirteenth Fairy brings a gift we wish could be refused; for ages 8-11.</p> <p>CT 13 Scheherazade and the Arabian Nights—A modern adaptation about the beautiful and wise storyteller who risks her life to save other women from a terrible fate; for ages 8-11.</p> <p>CT 14 Aladdin and the Magic Lamp—An adaptation of one of Scheherazade's best known stories, about the Tailor's son and an evil magician; for ages 8-11.</p> <p>CT 15 The Story of Atlantis—A haunting story of the legendary continent that vanished; for ages 8-11.</p> <p>CT 16 The Great Pyramids—A look at the mystery of one of the modern world's greatest wonders; for ages 8-11.</p> |
|---|--|

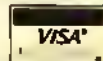
Send for a free catalog of over 1000 educational programs Atari, Apple, TRS 80 Color Computers.



DORSETT
Educational Systems, Inc.

Box 1226, Norman, OK 73070
IN OKLAHOMA CALL (405) 288-2301

CALL TOLL FREE
for more information
1-800-654-3871
Dealer inquiries welcome



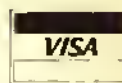


Saguaro Software



1-800-223-5369, Ext. 260

Monday - Friday 9 AM - 5 PM MST



**Just In Time For
Christmas!**

\$400



Amdek Dual 3" Disk Drive
Includes 2 Diskettes
And 2 Drive Cables

New!



Good

Color 300

Better

Color 400

Best

Color 500

**Call For
Lowest Price!**

GAMES

OIHXO

Othello machine language game for the 16K Co-Co. 2 modes of play - you against a friend or you against the computer. When playing the computer, it will play hard or easy. In either, you had better think hard! Object of the game is to change the opponent's spots to yours by placing your marker at the end of a row started by your marker. Not as easy as it sounds! Tape or disk. \$24.95. Amdek, \$29.95.

Co-Co Keno

Bring Las Vegas' Keno game home with Co-Co Keno. Bet \$1, \$3, or \$5 & mark off 1 to 15 spots...can you beat the odds & win \$50,000? 16K, high resolution screen. Keno chart print included. Tape - \$24.95. Disk - \$29.95. Amdek - \$34.95.

EDUCATION

Kidstuff

Picture, Letter, or Number Association. Play an old-time tune with correct answer (7 songs), buzzes when wrong & waits for correct choice, 8 screens. Tape - \$19.95. Disk - \$24.95.

Stars Of America

Education should be fun - this program is just that! This tutorial uses 25 of the superstars of American history, from George Washington to Ronald Reagan.

The Civil War

A challenging two-person game. Questions cover Carpet baggers to the Battle of Vicksburg. Points are assigned according to the difficulty of the question, scores are displayed throughout the game.

Both Only:

Tape \$19.95 Disk \$24.95

History From 1863 To 1976

On two 16K non-extended tapes. For 1-4 people. Informative & fun way to learn important dates in world history. Written for students by a teacher. Tape - \$19.95. Disk or Amdek - \$24.95.

ADVENTURES

Treasure Hunt

A graphics text adventure. You walk with our graphics character through desert, mountains and city to seek the elusive treasure of gold. Super graphics with a person who walks with you at each turn. Tape - \$24.95. Disk - \$29.95.

Do Or Die!

The year is 4001 A.D. You are a cargo trucker delivering a load in the Darlian star system. Your mission is to get back to your home planet at Irat, alive. Can you survive the journey? Tape or disk - \$24.95. Amdek - \$29.95.

Loveless Manor

Trapped in a bedroom by your evil aunt, you've admired Queen Cinderella's castle in the distance...and you've just discovered she's a distant cousin. Can you escape to her protection? 32K. Great word adventure. Tape - \$19.95. Disk - \$24.95. Amdek - \$29.95.

Roid On Boordonovko

Your mission, should you decide to accept it, is to steal Russia's newest weapon and save the world. Text adventure with 50 rooms. Tape - \$24.95. Disk or Amdek - \$29.95.

Search For The Llongth

After years of study & searching, you have at last traced the alien race at Llongth to this valley. Now your quest for the power of Llongth begins! Tape - \$24.95. Disk or Amdek - \$29.95.

APPLICATIONS

Co-Co Receivables

Keep track of all those accounts with current list of accounts, statement printing, last activity date, and current month's transactions, debits & credits. Disk storage of data. 32K disk. \$29.95.

Discount Software From 20% - 25% Off!

Prickly Pear Software

Liz Pack	\$145.00
Oracle II Tape	\$ 26.75
Non-Free Tapes	\$ 18.75
Color Kit	\$ 26.75
Disk Zapper	\$ 26.75
Super Scroll	\$ 18.75

Petrocci Freelance Associates

Telepatch 64K	\$11.75
Demon+ 64K	\$26.75
(Borland, Epoch 64, Master Boy)	
Astro Cast 32K	\$22.75
Adventure Game Decoder	\$11.75

Sugor Software

Radio System Design	\$22.75
Tim's Utility	\$11.75
Full Screen	
Screen Machine	\$22.75
Super Screen Machine	\$33.75

Tom Mix

Worlds of Flight	\$23.75
Chambers	\$19.75
Dragonair	\$21.75
SR-71	\$22.75
Space Shuttle	\$22.75

COMPUTER HOUSE - FILMASTR - \$23.75

Add \$3 For Disk. \$6 For Amdek

7331 E. Beverly Drive • Tucson, Arizona 85710

Arizona Residents Add 7% Tax • Add \$1.50 Shipping Per Program (\$5 Max)
Dealer Inquiries Welcome • Ask About Royalties • Some Quantities Limited

RAINBOWTECH



Downloads / <i>Dan Downard</i> _____	268
Answers to your technical questions	
Personable Pascal / <i>Daniel A. Eastham</i> _____	271
Procedures and functions	
KISSable OS-9 / <i>Dale L. Puckett</i> _____	280
Transportation to hacker heaven and two useful routines	

Some Easy Steps To Transmit With Null Modem

By Dan Downard
Rainbow Technical Editor

• *Can I run a RS-232C cable from the RS-232 jack on a CoCo 2 to the RS-232 jack on a CoCo 1 (silver cased one)?*

I called Radio Shack in Texas and the hardware and communications engineer told me I needed a null modem. I then called the local Radio Shack store and the customer representative took one out of the box and described it to me. One jack had four pins, the other jack had nine pins; those two female jacks were in a small box and the price was \$30. Do you know what all this is about?

Could you spoon feed some of us OS-9ers about the details of connecting two CoCos. I have two, and would like to use one and let my small cousins use the other one.

Dennis Anderson
Brooklyn, NY

A null modem is nothing more than a cable with a connector at each end. The send and receive lines are interchanged at one end.

In RS-232 technology, Pin 2 of the DB-25 connector is the Transmit Data line, Pin 3 is the Receive Data line. DB-25 is the terminology for a standard 25-pin connector used for RS-232 connections. Since our CoCos

only have four pins, we can say that Transmit Data is Pin 4 and Receive Data is Pin 2 of the four-pin jack on the rear of the computer.

Since we have to choose one device as the computer and another as the terminal, Pin 4 on one CoCo has to be connected to Pin 2 on the other, and vice versa. Thus, we have the Transmit Data of one CoCo connected to the receive Data line on the other. This is a null modem.

Don't forget the other two pins. Pin 1 at one end goes to Pin 1 at the other end, etc.

Now for communicating with OS-9. All that is really necessary to activate the time-sharing monitor in the host CoCo is to enter the command "TSMON /T1&". This will activate the RS-232 port and allow operation from the remote terminal and the CoCo keyboard at the same time. Be sure that you have the terminal set at 600 Baud, the default Baud rate for CoCo OS-9. If you wish to change the Baud rate, use the XMODE command.

A Slower Scroller

• *I love my CoCo for what it can do for the price I paid, but when I run a long program and list it, the lines go by the screen so fast I can't review them. Is there any way to make it scroll slowly up the screen? Also, I'd like to know who offers business-oriented ROM packs I can use for listing, adding, deleting and editing my customers' names. I don't have a disk drive (I have lots of spare time on*

my job to wait for the cassette tape). Can you help?

Bill Bernico
Sheboygan, WI

Try using the following little widget to slow down your scrolling rate: `POKE359,60`. This will not work for a disk system, Bill, but you are interested in tape.

For your mailing info I would recommend *TIMS* by Sugar Software. It is a tape-based database. I am not aware of any ROM packs that will do the job.

Printer Information

• *My computer is a CoCo 16K Extended BASIC with TRS-80 cassette recorder and a DMP-100 printer. I am practically a dummy when it comes to understanding BASIC so I depend on purchased software for programs.*

The June issue of RAINBOW contains an article on the Gemini-10X printer.

This article describes a manual that comes with the Gemini-10X and contains a world of information on the use of a printer. It says that by changing from LPRINT to PRINT#-2 the information in the manual applies to the CoCo. The manual that came with the DMP-100 contains a minimum of detail on applying the printer to various programs.

As I don't wish to purchase a printer to get the manual, can you suggest where I might purchase information on how to apply my new printer to the various programs I wish to copy?

Francis M. Lumley
Palmetto, FL

(Dan Downard is an electrical engineer and has been involved in electronics for 24 years through ham radio [K4KWT]. His interest in computers began about five years ago and he has built several 68XX systems.)

Francis, you cannot program a printer, you just change its mode of operation. In the case of a DMP-100, control sequences are sent to the printer to change the type of printing, such as emphasized, condensed, graphics, etc.

The reference to *LPRINT* vs. *PRINT#-2* in the article you mentioned was made due to the fact that on other computers the BASIC command to reroute text to the printer is *LPRINT* instead of *PRINT#-2*. Since we are dealing with CoCos, all references to *LPRINT* in the Gemini-10X manual should be changed to *PRINT#-2*.

The same information is contained in both manuals, e.g. control codes. The Gemini manual just gives examples. I wouldn't buy the manual just for the examples.

Learning To Backup

• About one month, my disk drive goes on a rampage. Usually, it just destroys the directory. I keep backup directories on other disks, as well as a backup directory on track zero. Last month though, the drive not only erased the directory, but damaged the directory track as well. All attempts at restoring the directory resulted in I/O Errors.

My question is this: Is there any way to make the disk drive use the backup directory I keep on track 0 as the working directory, ignoring track 17 completely, or is this a ROM function?

Also, is there a way to save a machine language program written on OS-9 so that it can later be loaded and used with Disk BASIC? If it can't be done on disk, is there a way to make a cassette save from OS-9?

Any information you could give me on these topics would be most appreciated.

John Ruzicka
Florham Park, NJ

John, track 17 is defined by the ROM as the directory track. You may be able to change this, but a simpler solution is evident.

Format a blank disk and try the *BACKUP* command. Unless track 17 is completely destroyed, all of the contents of the damaged disk will be copied to the new disk. Then, use your directory restoring program.

If you can't make a backup, try using one of the several disk-zapping utilities to make a sector-by-sector copy of the old disk to a freshly formatted disk. Do not copy track 17. Then, just copy track 0 of the old disk to track 17 of the new disk. It should be just like new.

The OS-9 assembler has a Motorola-compatible mode. The purpose of this mode is using the assembler for non-OS-9 programs. It can be invoked by the "m" option in the command line, or by using an *OPT* statement.

The trick is getting back to RS BASIC after using OS-9. One method I have used in the past is to enter the *DEBUG* module, change \$55 to 0 and hit the Reset button. Your assembled program will still be in memory, assuming it was not located in a memory location used by BASIC.

Trapping Those Characters

• In your November 1983 issue you had a program that would allow remote operation of the CoCo. I would like to know how to get the program to intercept a BREAK or CTRL-C code and change it to a space or skip it over altogether. If I don't get it to do this, people will be able to break out of the BBS I am making and could mess it up.

Harris Bockoven
Fort Dodge, IA

I've received a few phone calls on this subject, Harris. Most people are interested in a BREAK key disable patch to *REMOTE* for use in bulletin boards, etc. Both are accomplished in the same manner.

In the original listing Line 730 stripped the eighth bit from the received character before returning to BASIC. The received character at that time is in the A register. By inserting the following lines between Lines 730 and 740, any character can be trapped.

732	CMPA #50C	SOC=HEX CODE FOR
		BREAK
734	BNE IRET	EXIT ROUTINE IF
		NOT BREAK
736	LDA #0	REPLACE SOC WITH
		NULL

After adding these lines, the program should be reassembled with *EDTASM+*. If you want to move the starting address change Line 160. The receive Baud rate constant is in Line 225. The transmit rate Baud constant is in Line 220. Changing these values will change the Baud rate from 300 Baud.

As corrected in a later issue, the proper receive Baud rate constant should be changed in Line 225 from \$C9 to \$B8. \$B8 is the proper constant for 300 Baud.

Becoming Book Smart

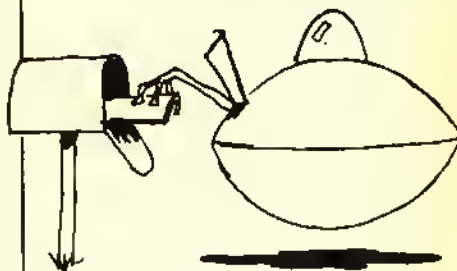
• I own a 64K Extended BASIC Color Computer. For the past few weeks I have been writing an assembly language program, but I have encountered a problem. How could I generate a large number of pseudo-random numbers? Using the memory map printed recently in THE RAINBOW, I have found the RND subroutine used by Color BASIC at \$BF1F. I have tried to disassemble this subroutine using ZBUG, but I quickly became lost. Do you know how this subroutine works and how I could call it in one of my own assembly language programs? In my opinion, the BASIC ROM contains a gold mine of useful functions, if only a way could be found to utilize these subroutines.

Patrick Shaughnessy
Bedford, MA

Patrick, I would suggest that you obtain a copy of *COLOR BASIC Unraveled* by Spectral Associates. Look for their ad in this month's *RAINBOW*.

You have the correct address for the random number generator in the Color BASIC ROM, but a thorough understanding of the floating point math used in the ROMs is necessary to utilize this subroutine. The above book is a commented disassembly of

The RAINBOW Back Issue Availability



Back copies of many issues of **THE RAINBOW** are still available.

All back issues sell for the single issue cover price. In addition, there is a \$3.50 charge for the first issue, plus 50 cents for each additional issue, for postage and handling if sent by United Parcel Service. A \$4 charge plus \$1 each additional copy for orders sent U.S. Mail. UPS will not deliver to a post office box or to another country.

Issues July 1981 through June 1982 are available on white paper in a reprint form. All others are in regular magazine form. VISA, MasterCard and American Express accepted. Kentucky residents please add 5 percent state sales tax. We do not bill and no C.O.D. orders accepted.

Due to heavy demand, we suggest you order back issues you want now while supplies last.

To order, just fill out the form on the next page and mail it with your payment to:

THE RAINBOW
9529 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059

BACK ISSUE ORDER FORM

☐ Please send me the following back issues:

(Payment must accompany back issue orders.)

MONTH		VOLUME 1		PRICE	
NO.	YEAR				
1	JULY '81	PREMIER ISSUE	\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
2	AUG. '81		\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
3	SEPT. '81	EDUCATION	\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
4	OCT. '81	PRINTER	\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
5	NOV. '81		\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
6	DEC. '81	HOLIDAY	\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
7	JAN. '82		\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
8	FEB. '82		\$2.00	<input type="checkbox"/>	<input type="checkbox"/>
9	MAR. '82		\$2.50	<input type="checkbox"/>	<input type="checkbox"/>
10	APR. '82		\$2.50	<input type="checkbox"/>	<input type="checkbox"/>
12	JUNE '82		\$2.50	<input type="checkbox"/>	<input type="checkbox"/>
VOLUME 2					
8	FEB. '83	BUSINESS	\$2.95	<input type="checkbox"/>	<input type="checkbox"/>
9	MAR. '83	NUCLEAR	\$2.95	<input type="checkbox"/>	<input type="checkbox"/>
10	APR. '83	SIMULATIONS	\$2.95	<input type="checkbox"/>	<input type="checkbox"/>
17	JUNE '83	PRINTERS	\$2.95	<input type="checkbox"/>	<input type="checkbox"/>
12	JULY '83	ANNIVERSARY	\$2.95	<input type="checkbox"/>	<input type="checkbox"/>
VOLUME 3					
1	AUG. '83	GAMES	\$2.95	<input type="checkbox"/>	<input type="checkbox"/>
2	SEPT. '83	EDUCATION	\$2.95	<input type="checkbox"/>	<input type="checkbox"/>
3	OCT. '83	GRAPHICS	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
4	NOV. '83	DATA COMM	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
5	DEC. '83	HOLIDAY	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
6	JAN. '84	BEGINNERS	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
7	FEB. '84	ADVENTURE	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
8	MAR. '84	BUSINESS	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
9	APR. '84	GAMING	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
10	MAY. '84	PRINTER	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
17	JUNE '84	MUSIC	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
12	JULY '84	ANNIVERSARY	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
VOLUME 4					
1	AUG. '84	GAMES	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
2	OCT. '84	GRAPHICS	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
3	NOV. '84	DATA COMM	\$3.95	<input type="checkbox"/>	<input type="checkbox"/>
		RAINBOW INDEX	\$2.50	<input type="checkbox"/>	<input type="checkbox"/>

TOTAL _____
 SHIPPING & HANDLING _____
 U.S. POSTAGE _____
 U.S. MAIL CHARGE _____
 KY RESIDENTS ONLY _____
 ADD 5% _____
TOTAL AMOUNT _____
 ENCLOSED _____

Name _____ Address _____ City _____ State _____ ZIP _____

☐ VISA ☐ MC ☐ AE

CARD # _____ EXPIRATION DATE _____ PHONE # _____

the ROM and should give you a head start at understanding how the entire system works.

Using All Your Memory

• I have seen many ads in THE RAINBOW for memory bank switchers that allow you to use all 64K for your programs. But I thought that usable memory was limited by the SAM chip which can only read 64K at one time. So how can these programs allow you to use 64K RAM yet still allow you to use the BASIC ROMs which take up about 32K? The total would be 96K and I thought this was impossible for the SAM chip to monitor at once.

I have also seen ads for 128K memory boards. Once again, exactly how much memory can we use at one time on our CoCos? These ads also talk about switching. My main question about this is how much memory can I use to write a BASIC program?

I have seen ads in THE RAINBOW for program packs that give C/PM ability. What is C/PM? How is it possible to use a Z-80 on our computer? I have read that one TRS-80 business computer uses a 68000 and a Z-80 micro-processor.

Do you know of any way to increase the actual user RAM available in BASIC? I don't mean for storing variables or data but to use freely just like the 32K normally available. I've never heard of it done but can a different chip than the SAM be used that has the ability to monitor more memory? Or maybe a different CPU can be used as long as it remains compatible with present CoCos?

Dominic Tynes
 Poplarville, MS

You are correct, Dominic, the 6809 can only address 64K, but this means that only 64K of memory can be online at one time. Another constraint is the fact that the CoCo uses a 16-bit address bus. Two to the sixteenth power is 64K.

I am using a 64K Disk BASIC CoCo, and have 64K of RAM. I have 32K of ROM space available. I have two drives at 161K each. I guess you could say I have 428K of memory online. With two more drives this figure would change to 750K.

Even though the 6809 can address only 64K, you can have an unlimited amount of memory. I have seen 20 meg hard disks at RAINBOWfests.

It is possible to address more than 64K of RAM using a method called bank switching. Under normal modes of operation your CoCo has 32K of RAM and 32K of ROM (only 24K of ROM space is actually used). Let's put another 256K of memory in the CoCo. Sounds easy, doesn't it? Well it is possible. By using a latch, or addressing scheme, and some decoding hardware on the RAM chips you can divide the 256K into eight 32K segments, or banks. Each bank would replace the original 32K of RAM by poking a different value into the addressing scheme. A similar bank switching scheme is used in your present CoCo when you switch the upper half of memory from ROM to RAM.

Will this allow me to write longer BASIC programs? Not with Color BASIC. New soft-

ware will be necessary to sense when one bank of RAM is full, automatically switching to the next bank, etc.

As far as using CP/M on a CoCo, a plug-in adaptor is available from Color Power Unlimited to allow the use of this operating system. CP/M is a registered trademark of Digital Research Corp. and also the name of their operating system for the Z-80 micro-processor. When you plug in this adaptor, the 6809 in your CoCo is actually replaced by a Z-80. The 6847 video display generator chip is replaced also with a 6845 allowing an 80 x 24-character screen display. You essentially have a new computer. This product will be reviewed very shortly in THE RAINBOW.

Building A Disk Drive

• I have just inherited a Model II with one built-in disk drive, and an expansion unit containing an outboard drive.

Is there any way I can use that outboard monstrosity as a drive 0 for my CoCo? I realize that there is probably no software sold for the CoCo in the eight-inch format, but some of the programs I have on tape are transferable to disk and it might be worth buying a controller to be able to use that big disk for data storage.

Neil Edward Parks
 Beachwood, OH

I don't think your problem is insurmountable, Neil, but plan on spending a great deal of time experimenting. Even if you succeed, your software will not be compatible with any other CoCo disk system.

First, it is possible to interface an eight-inch drive with the Color Computer. The Western Digital 1793 chip used in the disk controller can be programmed to work with an eight-inch drive. I believe the clock speed will have to change. You will have to obtain a data sheet on the 1793 from Western Digital. You will also have to obtain a complete user's manual on the outboard drive obtained with your Model II and the CoCo disk controller. The rest is up to you.

I thought about doing the same thing once, but with the price of a Radio Shack disk drive taken into consideration it didn't seem to be worth the time.

Another thing to consider is the fact that the standard format for eight-inch drives is single density, 77 tracks, 16 sectors per track. Some simple math will produce the fact that there is just as much storage capacity on a 5 1/4-inch double density diskette.

If you still are not discouraged, look at an article in May 1981 Byte named "Build a Super Simple Floppy Disk Interface."

At the same time, if any of our readers have been successful in interfacing an eight-inch drive, please write. We will pass along any information received.

Your technical questions are welcomed. Please address them to: Downloads, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We reserve the right to publish only questions of general interest and to edit for space and clarity.

PERSONABLE PASCAL

Procedures And Functions

By Daniel Adams Eastham
Rainbow Contributing Editor

Now that we have learned about PASCAL's executable statements and most of its data typing capabilities, we can delve a little into structuring a program. This is something you have always done when writing a program. At the very least you set up a first part that does all of your initialization including things like opening files and reading in initial parameters. This is followed by a second part which performs whatever processing the program is primarily written to do. Finally, there is a last part which prints totals, closes files or performs any other cleanup activities required.

Although a BASIC program cannot have any formal structure, most of us have at least done some informal structuring using ranges of line numbers or by imbedding comments. Setting up this structure makes it easier to figure out where a particular activity is occurring in your program when you need to debug or change it.

(Daniel Adams Eastham holds a B.S. degree in computer science and has 13 years experience in systems and communications programming, including work on the original Telenet packet switching network. He is the author of the DEFT PASCAL Workbench and is currently president of DEFT Systems, Inc.)

PROCEDURE Statement

In PASCAL, you use PROCEDURE and FUNCTION "declaration" statements in order to directly specify the structure of your program. These statements not only formally divide up your program, but can also provide some very powerful features. A PROCEDURE has the following form:

```
PROCEDURE <identifier> [(
    <parameter>; <parameter>; ...;
    <parameter>)];
<declaration statements>
BEGIN
    <executable statements>
END;
```

You can see that a procedure is structured almost identically to a PASCAL PROGRAM. The <identifier> is the name of the procedure and is used in order to *invoke* or activate the procedure.

Parameters

After the <identifier> you may have a parameter definition. A parameter is a piece of data that affects the operation of the procedure. For example, in BASIC the SET statement can be thought of as a procedure that has three parameters: the X and Y coordinates of a dot on the screen and the color to which that dot should be set. Each time you invoke the

procedure, you can pass it different values to operate on.

In PASCAL you are not restricted to the predefined procedures and functions that come with the language. You can define your own including defining the number, types and meaning of the parameters that must be passed to them. This gives you a lot of flexibility in that you can take large or small sections of your program and make them into your own procedures and functions to simplify the flow of your program at any given point.

The <parameter>s in the PROCEDURE statement itself are referred to as "formal" parameters. At the point in your program where you actually invoke the procedure and specify the variables, constants or expressions to be used, the parameters are referred to as actual parameters. The general form of a formal parameter is:

```
VAR <identifier>, ..., <identifier>:
    <type identifier>
OR
<identifier>, ..., <identifier>: <type
    identifier>
```

The VAR at the beginning of a list of <identifiers> is optional and when present indicates that each <identifier> represents a reference parameter as opposed to a value parameter. The differ-

ence between these two types of parameters is explained in detail later on.

The <identifier>s are the names of the parameters that will be used inside the procedure. They are variables of type <type identifier> which are known only within the procedure and can be used inside the procedure like any other variables. For example:

```
PROCEDURE SimpleProc (First,
                      Second : Real ;
                      VAR Sum : Real);
BEGIN
  Sum := (First + Second) /
  AnotherVar;
END;
```

In this example, First and Second are value parameters and Sum is a reference parameter. All three are used in the procedure's assignment statement.

The variable AnotherVar is a variable which is defined globally to this procedure. In a future article, we will discuss block structure and scoping. For now, variables will only be considered to be defined within a procedure or in the main program. AnotherVar is a variable that is defined in the main program and must be of type real or integer.

Invoking a Procedure

One important characteristic of parameter variables is that they may already be initialized with some value when the procedure begins executing. The values that they will assume will be those of the actual parameters used when the procedure is invoked. In the above example, the formal parameters First and Second assume the values of the actual parameters at the point where the procedure is invoked. For example:

```
PROGRAM SimpleProg (Input,
                    Output);
VAR AnotherVar, ResultVar, Second-
    Result : Real;
```

```
PROCEDURE SimpleProc
  (First, Second : Real ;
  VAR Sum : Real);
BEGIN
  Sum := (First + Second) /
  AnotherVar;
END; (* SimpleProc *)
```

```
BEGIN (* SimpleProg *)
  AnotherVar := 3.7;
  SimpleProc(7, 23.2*4, ResultVar);
  AnotherVar := 17;
  SimpleProc (AnotherVar, Result-
  Var, SecondResult);
END.
```

In the above program, AnotherVar, ResultVar and SecondResult are variables which are declared in the main program. Execution begins with the assignment of 3.7 to AnotherVar. The next statement invokes the procedure SimpleProc much like a GOSUB in BASIC. However, in this case the actual parameters 7, 23.2*4 and ResultVar are assigned to the corresponding formal parameters First, Second and Sum.

The result of the procedure execution is to put the value $(7 + (23.2 * 4)) / 3.7$ into ResultVar. When the procedure is finished executing, control returns to the statement in the main program following the statement that invoked the procedure. The last procedure invocation puts the value $(17 + 29.67567568) / 17$ into the variable Second Result.

Reference vs. Value Parameters

There are two ways to relate an actual parameter to its corresponding formal parameter. The first way is to copy or assign the value of the actual parameter to the formal parameter. This technique allows you to use full expressions as actual parameters since the resulting value is to be assigned to the formal parameter in exactly the same manner as if it were an assignment statement. This is the technique used by value parameters (those which do not have the word VAR in front of them).

The second way is to make the actual and formal parameters the same. In this case, you do not have to copy the data and if the procedure modifies its formal parameter, the actual parameter is what is actually modified. This technique is used by reference parameters (those which do have the word VAR in front of them). When you have defined your formal parameters as reference, your actual parameters must be variables.

Reference parameters are frequently used when passing large arrays or records for use by a procedure or when the intended result of the procedure is to modify one of the actual parameters (as in Sum in the above example).

Value parameters are used when you are treating them truly as input data, do not want to modify the actual parameter or wish to use expressions as actual parameters.

Functions

Functions are almost exactly the same as procedures except that they also have a formal returned value. A FUNCTION has the following form:

```
FUNCTION <identifier> [(<para-
```

```
meter>; <parameter>; ...; <para-
```

```
meter>)]
```

```
: <type identifier>;
```

```
<declaration statements>
```

```
BEGIN
```

```
<executable statements>
```

```
END;
```

You notice that this is exactly the same as a procedure except that the FUNCTION statement itself is typed (as <type identifier>). We can take our SimpleProc example and make it into a function example:

```
PROGRAM SimpleProg (Input, Out-
put);
```

```
VAR AnotherVar, ResultVar, Second-
    Result : Real;
FUNCTION SimpleFunc (First,
                    Second : Real) : Real;
BEGIN
  SimpleFunc := (First + Second) /
  AnotherVar;
END; (* SimpleProc *)
BEGIN (* SimpleProg *)
  AnotherVar := 3.7;
  ResultVar := SimpleFunc(7, 23.2*4);
  AnotherVar := 17;
  SecondResult := SimpleFunc (Ano-
  therVar, ResultVar);
END.
```

This example produces exactly the same result as the example using the procedure SimpleProc. In this case, SimpleFunc has two value parameters, First and Second and returns a Real result. The assignment statement in the function uses the function name on the left side. Every function must have at least one assignment statement which does this. It is this assignment statement which actually sets up the function's returned value.

The statements in the main program use the function on the right side of assignment statements so that the resulting value is placed in the variable on the left side. A function can be thought of as a read-only variable which can be used in expressions exactly like a variable.

Example Program — Dead Reckoning

The example program this month is a part of one I wrote a couple of years ago to help me with my flight planning. This program takes as inputs: the wind direction and speed, my aircraft speed, and my route of flight in the form of some number of cross-country legs.


```

11 0032 Writeln
11 0033 Writeln 'DEAD RECKONING NAVIGATION'
11 0034 Writeln
11 0035 Write 'TRUE AIRSPEED (KNOTS): '
11 0036 Readln (AirSpeed)
11 0037 Write 'WIND SPEED (KNOTS): '
11 0038 Readln (WindSpeed)
11 0039 Write 'WIND DIRECTION (DEGREES): '
11 0040 Readln (WindDir)
11 0041 Write 'MAGNETIC VARIATION: '
11 0042 Readln (MagneticVar)
11 0043 Write 'DEPARTURE TIME (HR,MIN): '
11 0044 Readln (DepartHour, DepartMinute)
11 0045 DepartTime := DepartHour * 60 + DepartMinute / 60
11 0046
11 0047 Renrte (Printer, '1:2')
11 0048 Page (Printer)
11 0049 Writeln (Printer, '1:27, 'Navigation Log')
11 0050 Writeln (Printer, '1')
11 0051 Writeln (Printer, 'True Mag Ground
11 0052 ' True Mag'
11 0053 Writeln (Printer, 'Checkpoint Course Course Speed Distance
11 0054 'Heading Heading Time')
11 0055 For I := 1 To 68 Do Write (Printer, '-')
11 0056 Writeln (Printer)
11 0057 Writeln (Printer, '1')
11 0058
11 0059 TotalTime := 0
11 0060 TotalDist := 0
11 0061
11 0062 End
11 0063
11 0064 *****
11 0065 *
11 0066 * Print time in hh:mm:ss
11 0067 *
11 0068 *****
11 0069
11 0070 PROCEDURE HourMinute (VAR OutFile: Text; Time: Real)
11 0071
11 0072 VAR Minutes: Integer

```

```

11 0073 BEGIN
11 0074 Minutes := Round (Time * 60) - (Trunc (Time) * 60)
11 0075 Write (OutFile, Trunc (Time):3, ':')
11 0076 IF Minutes > 9 THEN Write (OutFile, Minutes:2)
11 0077 ELSE Write (OutFile, '0', Minutes:1)
11 0078 END
11 0079
11 0080 *****
11 0081 *
11 0082 * Get Coordinate Information
11 0083 *
11 0084 *****
11 0085
11 0086 FUNCTION Coordinate (Prompt: String): Real
11 0087
11 0088 VAR Degree, Minute, Second: Real
11 0089
11 0090 BEGIN
11 0091 Write (Prompt, 'DEG, MIN, SEC: ')
11 0092 Readln (Degree, Minute, Second)
11 0093 Coordinate := (Degree + Minute / 60 + Second / 3600)
11 0094 END
11 0095
11 0096 *****
11 0097 *
11 0098 * Compute and print one leg of the trip
11 0099 *
11 0100 *****
11 0101
11 0102 PROCEDURE ComputeLeg
11 0103
11 0104 VAR LongDist, LatDist, WindTrueRad, CrsWindRatio, HeadCrsRad
11 0105 : Real;
11 0106 Distance, TrueCourse, GroundSpeed, TrueHeading,
11 0107 WindTrueAng : Integer

```

WOW!
How do you get a
full 80 column
Word Processor
on the CoCo?

Oh, I just use
Stylograph and
the PBJ WordPak
80 Column Board

The STYLOGRAPH III WORD PROCESSING SYSTEM is packed with many features! . . .

- * Stylo comes with a 51 x 24 Hi-res screen driver called GO-51, which is compact and efficient (doesn't waste memory space).
- * Totally compatible with the PBJ 80 column board called WORDPAK.
- * Immediate screen updating shows the text just as it will be printed.
- * Screen shows all page separations, headers and footers, justification of text and uses reverse video for character modifications.
- * Stylo can be configured to your printer. Proportional Spacing is supported to give you the professional quality look.
- * Stylo is available for the OS/9 and Flex operating systems.
- * Additional programs like Mail Merge and Spelling Checker are also available to give you a complete word processing package.
- * Stylograph is now available at your local Radio Shack Dealer.

Prices have been lowered making Stylograph and
WordPak the best buy in town

Stylograph III	\$99.95	WordPak	\$119.95
Spelling Checker	69.95	WordPak II	149.95
Mail Merge	59.95		
All three programs	\$199.95	Send for our complete catalog	

Great Plains Computer Company

P.O. Box 916
Idaho Falls, Idaho 83403
(208) 529-3210

OS9 is a trademark of Microware

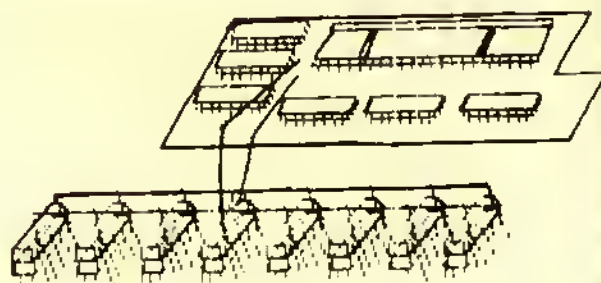
Flex is a trademark of TSC, Inc.

128K

THE EASY WAY

SOLDERLESS MOD FOR

ALL 64K COCOS*



ONLY \$99.00
 INCLUDES ADDITIONAL 64K OF RAM
LOGIC BOARD WITHOUT 64K RAM ONLY \$34.95

* ADAPTOR FOR D, E, AND COCO 2 \$9.95 EXTRA

GAMES

PICTURE PUZZLE	9.95 (C)
	12.95 (D)
TRAPFALL	27.95 (C)
AIR TRAFFIC	
CONTROLLER	28.95 (C)
GRABBER	27.95 (C)
DEVIL ASSAULT	27.95 (C)
BUZZARD BAIT	27.95 (C)
THE KING	26.95 (C)
DEATH PLANET	19.95 (C)
ROBOTTACK	24.94 (C)
THE FROG	30.95 (D) 27.95 (C)
STELLAR SEARCH	24.95 (C)
STELLAR SEARCH	27.95 (D)
AIRLINE	24.95 (C)
INATAK	24.95
CASHMAN	27.95 (C)
OUTHOUSE	27.95 (C)
AREX	34.95 (C)
ZAXXON	39.95 (D)
ELECOTRON	24.95 (C)
WORLD OF	
FLIGHT	32.95 (D) 29.95 (C)
HYPER ZONE	26.95 (C)
JUNIORS REVENGE	28.95 (C)
BUMPERS	24.95 (C)

HI - RES ADVENTURES

SHENANIGANS	24.94
CALIXTO ISLAND	24.95
BLACK SANCTUM	24.95
TOUCHSTONE	27.95
TIME BANDIT	27.95
KING TUT	29.95
SEA QUEST	24.95

APPLICATION

ELITE-WORD	59.95
ELITE-FILE	74.50
VIP WRITER	59.95
VIP DATABASE	59.95
VIP SPELLER	39.95
VIP TERMINAL	49.95
VIP DISK ZAP	39.95
TELEWRITER	TAPE 49.95
TELEWRITER	DISK 59.95
VIP CALC	59.95

ELECTRONIC CALLIGRAPHER

FOR EPSON/GEMINI, PROWRITER,
 OR RADIO SHACK PRINTERS
 TWO FONTS OLD ENGLISH &
 CHANCERY CURSIVE
DISK ONLY NOW \$18.95

FULL SCREEN EDITOR	19.95
PRINTER SPOOLER 64K	9.95
SUPER SCREEN	29.95 (C)
GRAPHIC SCREEN PRINT	
FOR GEMINI	9.95 (C)
FOR EPSON	9.95 (C)
FOR OKIDATA	9.95 (C)
FOR PROWRITER	9.95 (C)
FOR LP VII/RS	7.95 (C)

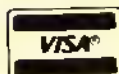
ACCESSORIES

EPSON RIBBONS	7.49
GEMINI RIBBONS	2.95
LP VII, DMP100 RIBBONS	4.95
DISKS	
SENTENIAL SS/SD	19.95
SENTENIAL SS/DD	22.95
VERBATIM	34.95
2 WAY RS232 SWITCHER	29.95
3 WAY RS232 SWITCHER	39.95
CASSETTE CABLE	5.95
64K RAM EMBLEM	2.95
BOTEK INTERFACE	59.95
FOR EPSON	69.95
HJL-57 KEYBOARD	79.95

DSL COMPUTER PRODUCTS INC.

313-582-8930

P.O. BOX 1176 DEARBORN, MI 48121



There's more to than meets the eye.



File Handlers Toolbox \$85.00

The File Handlers Toolbox: a new utility command toolbox specially designed for OS-9 users who do a lot of file manipulation. The package is a collection of twelve OS-9 command programs, including equivalents of some of the most popular UNIX* utilities that are not included in the basic OS-9 command set. Most of the programs are useful as "filters" using the OS-9 pipeline facilities.

Entertainment Pack \$85.00

Entertainment Pack I is a collection of programs written in Basic09 for the OS-9 Operating System. The package consists of games and other interesting programs that are not only entertaining but serve as excellent instructional examples of Basic09 programming techniques. All programs include complete source files and can be easily edited to run on standard alphanumeric or graphics terminals.

CIS Cobol \$400.00

CIS COBOL, which meets the ANSI standard for Level One Cobol plus selected features from Level Two, is ideal for microcomputers. This system lets you run Cobol on your small computer and is a great way to learn Cobol.

Relocatable Macro Assembler \$125.00

At last — a full feature relocatable macro assembler and linkage editor for OS-9. RMA permits sections of assembly language programs to be independently assembled to "relocatable object files". The linkage editor takes any number of program sections and/or library sections and combines them into a single executable OS-9 memory module. Global data and program references are automatically resolved in the process. RMA also supports conditional assembly and library source files.

The Official OS-9 Manual Set \$40.00

The complete, unabridged OS-9 manual set direct from Microware. This three manual set contains complete information on writing device descriptors, disk drivers and full explanations of how OS-9 works. A great addition to the serious OS-9 programmers library.

The BASIC09 Tour Guide \$18.95

Map out your route through the Mercedes of Basics . . . Basic09 with the **official Basic09 Tour Guide**. Skillfully written in a friendly and easy to read style this book will put you in the drivers seat in no time. Fasten your seatbelt, sit back and enjoy the ride to perfecting your programming skills.

That's just the beginning . . .

GET EYE TO EYE WITH MICROWARE AND OS-9

microware®
OS-9™

MICROWARE SYSTEMS CORPORATION • 1866 N.W. 114th STREET • DES MOINES, IA 50322
TELEPHONE 515/224-1929 • TELEX 910-520-2535

OS-9 and BASIC09 are trademarks of Microware and Motorola. UNIX is a trademark of Bell Laboratories, Inc.


```

10 051E BEGIN
11 0525 LongDist := 60.0 * (LongLude - LatLongL) *
12 053E COS (LatLudeL + LatLudeL / TwoRad)
13 054E LatDist := 60.0 * (LatLude - LatLudeL)
14 0550 Distance := Round (Sqr (Sqr (LongDist) + Sqr (LatDist)))
15 0560 IF ABS (LongDist) < 0.01 THEN
16 0574 IF LatDist < 0.0 THEN TrueCourse := -90
17 0580 ELSE TrueCourse := 90
18 059E
19 060E ELSE BEGIN
20 0614 TrueCourse := Round (ArcTan (LatDist / LongDist) * RadianL)
21 062E IF LongDist < 0.0 THEN TrueCourse := TrueCourse + 90
22 063E ELSE TrueCourse := TrueCourse + 270
23 064E END
24 065E IF WindSpeed = 01 OR ABS (WindDirL - TrueCourse) < 51 OR
25 066E ABS (WindDirL - TrueCourse) - 360 < 51
26 067E THEN BEGIN
27 068E GroundSpeed := AirSpeed - WindSpeed
28 069E TrueHeading := TrueCourse
29 070E END
30 071E ELSE IF ABS (WindDirL - TrueCourse) - 180 < 51
31 072E THEN BEGIN
32 073E GroundSpeed := AirSpeed + WindSpeed
33 074E TrueHeading := TrueCourse
34 075E END
35 076E ELSE BEGIN
36 077E WindTrueAng := WindDirL - TrueCourse + 180
37 078E IF WindTrueAng > 180 THEN WindTrueAng := WindTrueAng - 360
38 079E WindTrueRad := ABS (WindTrueAng) / RadianL
39 080E CrsWindRelL := WindSpeed * SIN (WindTrueRad) / AirSpeed
40 081E HeadCrsRad := ARCTAN (CrsWindRelL / SORT (1 - CrsWindRelL))
41 082E GroundSpeed := Round (AIRSpeed *
42 083E SIN (Pi - HeadCrsRad - WindTrueRad) /
43 084E SIN (WindTrueRad))
44 085E IF WindTrueAng < 0
45 086E THEN TrueHeading := TrueCourse + Round (HeadCrsRad * RadianL)
46 087E ELSE TrueHeading := TrueCourse - Round (HeadCrsRad * RadianL)
47 088E END
48 089E WRITE (Printer, TrueCourse:7, Magnetic (TrueCourse):8,
49 090E GroundSpeed:7, Distance:9, TrueHeading:10,
50 091E Magnetic (TrueHeading):9, ' ')
51 092E HourMinute (Printer, Distance / GroundSpeed)
52 093E WRITELN (Printer)
53 094E TotalDist := TotalDist + Distance
54 095E TotalTime := TotalTime + (Distance / GroundSpeed)
55 096E END
56 097E *****
57 098E *
58 099E * Main Program Entry
60 100E *
61 101E *****
62 102E BEGIN
63 103E SetUp
64 104E
65 105E WRITELN
66 106E WRITE (STARTING POINT: '

```

```

01 0669 READLN (ChkPntName)
02 067F FirstTime := True
03 0685
04 0695 REPEAT
05 06A5 LatLude := Coordinate ('LATITUDE')
06 06B5 LongLude := Coordinate ('LONGITUDE')
07 06C4
08 06D4 IF FirstTime THEN FirstTime := False
09 06E4 ELSE ComputeLeg
10 06F4
11 0704 WRITE (Printer, ChkPntName, ' ')
12 0714 HourMinute (Printer, LatLude)
13 0724 WRITE (Printer, ' ')
14 0734 HourMinute (Printer, LongLude)
15 0744 WRITELN (Printer)
16 0754
17 0764 LatLat := LatLude
18 0774 LatLong := LongLude
19 0784
20 0794 WRITELN
21 0804 WRITE (CHECKPOINT: ' ')
22 0814 READLN (ChkPntName)
23 0824 UNTIL ChkPntName = ' '
24 0834
25 0844 FOR J := 1 TO 60 DO WRITE (Printer, '- ')
26 0854 WRITELN (Printer)
27 0864
28 0874 WRITE (Printer, Round (TotalDist / TotalTime):32,
29 0884 TotalTime:9, ' :21)
30 0894 HourMinute (Printer, TotalTime)
31 0904 WRITELN (Printer)
32 0914
33 0924 WRITELN (Printer, 'True Airspeed: ', AirSpeed)
34 0934 WRITELN (Printer, 'Wind Speed: ', WindSpeed)
35 0944 WRITELN (Printer, 'Wind Direction: ', WindDirL)
36 0954 WRITELN (Printer, 'Magnetic Var: ', MagneticVar)
37 0964 WRITELN (Printer, ' ')
38 0974 WRITE (Printer, 'Departure Time: ')
39 0984 HourMinute (Printer, DepartTime)
40 0994 WRITELN (Printer)
41 1004 WRITE (Printer, 'Arrival Time: ')
42 1014 HourMinute (Printer, ArrivalTime + TotalTime)
43 1024 WRITELN (Printer)
44 1034
45 1044 WRITELN ('TOTAL DISTANCE: ', TotalDist:51)
46 1054 WRITE ('TOTAL TIME: ')
47 1064 HourMinute (Printer, TotalTime)
48 1074 END.

```

Navigation Log							
Checkpoint	True Course	Mag Course	Ground Speed	Distance	True Heading	Mag Heading	Time
10K	39:25, 77:22	265	272	90	22	260	0:15
10B	39:23, 77:51	285	292	93	58	279	0:37
GRV	39:38, 79:03	262	269	90	38	257	0:25
10C	39:33, 79:52	280	287	92	46	278	0:30
75D	39:11, 80:51						
			92	160			1:17
True Airspeed:		99					
Wind Speed:		12					
Wind Direction:		228					
Magnetic Var:		7					
Departure Time:		1:45					
Arrival Time:		3:32					

One-Liner Contest Winner . . .

You've heard of falling stars? Well, here's a one-liner with a falling CoCo. Just type and *RUN*. If the CoCo hangs up after loading, just type *RUN* again.

The listing:

```

1 CLS:POKE65495,0:PMODE4:DIMN(50
,20):DRAW"BM9,9G1L4H2U3E2R4F1BD6

```

```

BR5H1U2E1R2F1D2G1L2BR14BU1G1L4H2
U3E2R4F1BD6BR5H1U2E1R2F1D2G1L2":
GET(1,2)-(40,11),N,G:SCREEN1,0:P
CLS:A=110:FORB=1TO185:PUT(A,B)-(
A+39,B+11),N,PSET:NEXTB:PLAY"01V
31L255T255ABGEV20AGEV10AFE"

```

Brian Patrick
Huntsville, AL

(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Adventure* and its companion *Rainbow Adventure Tape*.)

Sugar and Spice and Everything Nice . . .
We have the gift for everyone on your list!

. . . for the Arcade Game Player

Flying Tigers



16K Tape - \$24.95
32K Disk - \$27.95

- Try your skill and strategy against 7 different kinds of aliens
- 5 levels of difficulty
- Super hi-res graphics and animation
- Sensational space sound effects
- 100% Machine Language
- Joystick required

The aliens will materialize from hyperspace, at first, only a few at a time . . . then more . . . and more . . .

. . . for your Preschooler

PreReader



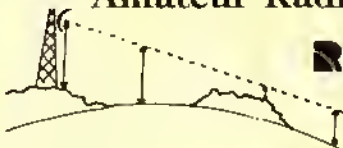
Level I - your child will work with colors, shapes, numbers, capital letters and small letters

Level II - your child will learn to associate individual letters and consonant blends with the sounds they make

Songs and happy faces for each correct answer!

32K ECB; Joystick Required
Tape - \$19.95; Disk - \$24.95

. . . for the Amateur Radio Enthusiast



Radio System Design Calculations

Helps design or evaluate:

- Land mobile radio systems
- Satellite TV
- Satellite data acquisition systems
- Aircraft radio systems
- Microwave systems
- Microvolt/DBM conversions
- Frequency/Wave length conversions
- System received signal levels
- Gain of parabolic antenna
- Propagation Calculations

32K ECB

\$29.95 - Tape

\$32.95 - Disk

. . . for the Rental Property Manager

Rental Property Income and Expense Management Package



Disk - \$34.95
32K Required

- Keeps track of all your rental properties
- Provides instant screen or printer summary of all your properties
- Maintains and prints a detailed, itemized listing of each of 28 expense categories
- Gives you a schedule of the Accelerated Cost Recovery System depreciation allowed for each tax year for 3, 5, 10 and 15 year property

. . . for the Programmer in the Family



AUTO RUN 64 - \$24.95
AUTO RUN - \$19.95
Tape

- Creates a ML loader which automatically starts up your Basic or ML program
- Title screen utility
- Provide an audio introduction
- Locates your program at the desired address



PIRATECTOR!™

You write the Basic or ML program. PIRATECTOR™:

- Supplies protection scheme
- Includes Semigraf graphics editor
- Incrementing serial numbers
- Many user subroutines included
- Effective against popular piracy/protection cracking programs

32K Disk
\$99.95

Last Minute Gift?

Call (614) 861-0565 for Same Day Service.

We will include a gift card if you wish.

Best Wishes for a Happy, Healthy Holiday Season from Sugar Software

We make all of our holiday greeting cards with

The CoCo Calligrapher
and so can you!

The CoCo Calligrapher works on these printers:

Epson: MX80, FX80, 100 (8 1/2 x 11 size only), and all models with graphtrax

Gemini: 10, 10X, 15, 15X (8 1/2 x 11 size only)

Radio Shack: LP7, LP8, DMP100, 110, 120, 200, 420, 510, 2100

Okidata: 92A - unless it is version 4. The ROM has a bug and the dealer should replace it for you.

Banana: Behaves like a Radio Shack

Prowriter: 8510

These type styles come on the CoCo Calligrapher program tape or disk:

Old English
Gay Nineties
Cartoon

Tape - \$24.95

Disk - \$29.95

Both require 32K ECB

These additional type styles are also available ---
\$19.95 each, or \$49.95 for all on tape or disk.

Tape 1

Old English-reduced	Cartoon-reduced	Gay Nineties-reduced
Old English-reverse	Cartoon-reverse	Gay Nineties-reverse
Old English-reverse/reduced	Cartoon-reverse/reduced	Gay Nineties-reverse/reduced

Old English Cartoon Gay Nineties

Tape 2

Broadway
Broadway

Broadway
Broadway-reduced
Broadway-reverse
Broadway-reverse/reduced

Tape 3

Business
Business

Business
Business-reduced
Business-reverse
Business-reverse/reduced

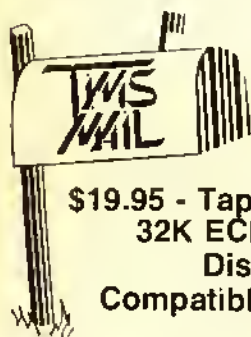
Old Style **Antique**
Old Style **Antique**

Old Style
Old Style-reduced
Old Style-reverse
Old Style-reverse/reduced

Antique
Antique-reduced
Antique-reverse
Antique-reverse/reduced

Simplify all of your Holiday Mailing

with
TIMSMAIL



\$19.95 - Tape
32K ECB
Disk
Compatible

- User friendly
- Detailed tutorial & guide
- No blank line!
- Send formatted file to tape, disk, or printer
- Upper and lower case
- Up to 230 characters per record

Address all your holiday greeting cards in minutes! Update your list in seconds!

- Designed for 80 column printers
- Continuous feed or single sheet labels
- 1, 2 or 3 labels wide
- 2.5, 2.75, 3, 3.5 and 4 inch labels
- Sort by zip code
- Sort by name
- Select records to print
- About 200 records will fit in 32K

Spend some quality time with your family and play

Bible
Stories
Adventure

Tape -
16K ECB - \$19.95
Disk -
32K ECB - \$24.95

A very simple graphics adventure game for young children and their families.

All of these stories are included:

- Adam and Eve
- Noah's Ark
- Abraham and Isaac
- The Exodus
- David and Goliath

Intriguing sound effects. Exciting high-res graphics and animation. The one adventure game that's fun to play over and over again!



Disk software compatible with Radio Shack DOS only.
A complete catalog of other sweet Sugar Software products is available.

SUGAR SOFTWARE
2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

No refunds or exchanges.



Add \$1.00 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405 1374. Dealer inquiries invited.

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J 3L1 (403) 421-8003.

KISSable OS-9

Transportation To Hacker Heaven — And Two Useful Routines

By Dale L. Puckett
Rainbow Contributing Editor

This column is going to be a short one. We had this project we needed to finish. THE RAINBOW wants to get it in your hands by Christmas. So, we hit it — 12 to 15 hours a day for the past two weeks. I may never want to hear the name OS-9 again, but *The OS-9 Tour Guide* is in the capable hands of the editorial staff at THE RAINBOW.

It's A Book

Why did Peter Dibble and I want to write a book about OS-9? Why did THE RAINBOW want to publish one? The main reason — you need it.

Since its release on the Radio Shack Color Computer in October 1983, Microware's OS-9 Operating System has created a stir. Power-packed and effi-

cient, OS-9 brought a UNIX-like environment to an inexpensive microcomputer for the first time.

Old-timers and hackers revelled in its power. Many beginners however, found it intolerable.

After answering hundreds of questions in this column, we discovered a pattern. People with no computer training or experience were rushing to their local Radio Shack and buying OS-9. Then, they rushed home, proudly inserted their new operating system and went to work.

With little fanfare and without too much difficulty, these converts learned to build files and list them to their CoCo's screen. Some even learned how to climb around on OS-9's directory tree. But eventually the honeymoon ended and a lot of new OS-9 users discovered that they didn't have the slightest idea about what to do with their new operating system.

Experienced users who had learned how to program using the Color Computer's MicroSoft BASIC, knew what they wanted to do. But OS-9 proved an alien environment to many. They found themselves lost in a reference manual that gave experienced mainframe programmers everything they needed, but left beginners wondering where to start.

In our new book, Peter and I have tried to lay down a foundation that will let you build a staple of OS-9 program-

ming skills with ease. We've divided *The OS-9 Tour Guide* into six parts.

Part One presents an overview of OS-9. It gives you "The Big Picture." We encourage you to leave your computer off when you read it.

In Part Two we encourage you to turn your computer on, use our examples and experiment. You'll get your "Hands On" OS-9.

Part Three takes you on a seven-chapter tour of the complete OS-9 Utility Command Set. Each chapter introduces you to a number of commands that perform logically related functions.

In Part Four we introduce you to the major programming languages that run on OS-9 computers. You'll also learn a little about assembly language programming and OS-9 "toolkits." We have listed the assembly language code for several filters. Additional filters are written in C. Nearly two dozen BASIC09 listings introduce you to that state of the art language.

Part Five will move you "Toward the End of The Rainbow." Here you'll look inside OS-9 and explore the inner workings of Microware's operating system. You'll be in hacker heaven.

Finally, in Part Six, we'll show you the "Pot of Gold" that lies at the end of The Rainbow. You'll find several major listings including a hard disk driver, several ACIA drivers, etc. The additional sample modules are a bonus.

(Dale L. Puckett is a free-lance writer and programmer who has worked with the Motorola family of microprocessors since 1976. He just completed his first book, The Official BASIC09 Tour Guide, this summer. It has been published by Microware and made its debut at the Chicago RAINBOWfest. He is the author of DynaSpell, Readtest, Esther and Help, which are available from Frank Hogg Laboratories. He serves on the Info World Software Review Board and is a Chief Warrant Officer in the U.S. Coast Guard.)

Microware's Third Annual OS-9 Users Seminar

Microware's OS-9 Users Seminar is just like a fine wine. It gets better with age. This year was the third for the seminar and a success on all counts. As Bob Sorenson, a Microware programmer, remarked when he opened his tutorial about making new boot files, this seminar proves that people other than the programmers at Microware use OS-9.

RAINBOW publisher Lonnie Falk and I enjoyed the special two-hour Color Computer OS-9 session presented by Microware President Ken Kaplan.

"I guess I should start by saying that memory and disk space are a little tight on the Color Computer," Kaplan said. "No one at Tandy realized that BASIC09 wouldn't fit on the system disk."

After that tongue-in-cheek start, Kaplan proceeded to hand out good advice to Color Computer owners. He started with *Binex* and *Exbin* and compiled a list of programs you could safely remove from the backup of your Radio Shack OS-9 system disk that you use daily. *The OS-9 Tour Guide* has a complete chapter on this subject.

Then, he attacked the memory problem and named a few modules that could be removed from a beginners OS9Boot file. "Get rid of RS-232, PRINTER, /T1, /D2 and /D3, etc." he said.

In shotgun fashion, Kaplan spit out round after round of tips. We'll highlight them here.

— To use a communications program with Color Computer OS-9 you really need the Radio Shack RS-232 cartridge.

— The new updated Version 1.1 of Color Computer OS-9 has an ACIA driver built in. It's named ACIAPAK. A new device descriptor, /T2, uses it.

— The new release also has the Boot file loaded in a logical manner. The file manager is followed by the device drivers that use it. They are followed by the device descriptor that uses them.

— The bit rate data for the PRINTER and RS232 modules has been fixed.

— Graphics functions can be executed by simply sending out the special ASCII graphics codes listed in the appendix of the OS-9 Commands manual.

— An unwanted screen pause can be a problem when you are using graphics and print carriage returns. You can get around the problem if you are using

BASIC09 by using the PUT statement instead of the PRINT statement.

— Microware may do another release of the GFX graphics package — actually the drivers built into OS-9 — that will give you the *PAINT* and *DRAW* commands you are used to with Extended Color BASIC.

— The mouse on the Color Computer looks just like a joystick to the software. This means you can put it to work with OS-9's built-in joystick routines.

— You can't pause when using the PRINTER module. There's nowhere for the "go ahead character" to come from.

— It is very dangerous to change disks in the middle of a session, especially if you forget and leave files open for update or write.

— Microware's COBOL compiler actually works pretty well on the Color Computer. However, because the language uses forms, it needs an 80-column card or an external terminal.

— Color Computer users were the first people in the world to receive XMODE utility command.

"SysCall... lets you program OS-9 system calls directly in your BASIC09 program."

— Kaplan noted that it is really not too unreasonable to run with two users on the Color Computer. He discussed the confusion regarding Baud rates on the external terminal and noted that it really only works well at 300 Baud. The reason — the frequency of the real-time clock on the Color Computer. It's only 60 Hertz.

— Why does the system freeze every time you do any disk input or output? The Radio Shack disk controller cartridge has the interrupt line from the Disk Controller connected to the halt line on the 6809. When the controller is finished with a read or write, it "unhalts" the processor using the 6809's NMI line.

— Ken mentioned that a lot of you have had trouble getting OS9Boot files configured properly and noted that many

people have problems with the Baud rates.

— "On a Level I system, you can set the Baud rate all you want — until you initialize the driver. Once you do this, you cannot change it again. It is locked into the tables," Kaplan said.

As the session pushed toward the two-hour mark, Kaplan got out his crystal ball and looked at the future. He started by telling how you will be able to get your update of OS-9.

Your local Radio Shack store will have a listing of everyone who bought Version 1.0. And if your name is on the list, they will order it for you. It will be shipped directly from Fort Worth. Oh! If you didn't fill out your registration card, your name won't be on the list. Kaplan expects the cost of the update to be approximately \$15.

What else is coming to Color Computer OS-9? Radio Shack is stocking OS-9 at ALL stores. This new policy started in September. Kaplan said that Version 2.1 of Microware's PASCAL compiler should be out in a month or so. And, DynaCalc just went into production.

Also on the software front, Radio Shack's TSEDIT — a screen editor with a high resolution screen and horizontal scrolling built in — has been ported to OS-9. It should be nearing the production stage.

Two Useful Routines

We're printing two useful routines this month. *SysCall* is an assembly language subroutine designed to work with BASIC09. It lets you program OS-9 system calls directly in your BASIC09 program. One of the handiest tools you'll ever find, it was written by Robert Doggett at Microware.

Also, we are presenting three BASIC09 procedures that show you how to create and use pipes. The procedure "POpen" creates a pipe by DUPEing one of the standard paths and using it as the path for the pipe that will go to or from the FORKED pipeline process. It uses *SysCall*.

The procedure "OutPipe" calls POpen to create a pipe to a spooler. The pipe lets the output of OutPipe be read and printed by the spooler. If you do not have a spooler program, you can open a path to any other program by changing the parameters in the *RUN* statement.

The procedure "InPipe" calls POpen to create a pipe from the OS-9 MDIR utility command to itself. InPipe can then read the standard output path from MDIR and display its output.

(continued on Page 284)

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Hard Drives



Introducing **MEGADISK™**

Winchester, Hard Drive ready to run on the TRS 80 Model I/III/IV/4P, Color Computer, I.B.M.-PC, Apple, Franklin, Max/80, Warranty 1 year Supporting LDOS, NewDos/80, Dosplus, TRSDOS 6.0

DRIVE A HARD BARGAIN™ Complete Systems Starting at \$999.95

Call Toll Free Ordering 1-800-343-8841



High Quality Lowest Price
Drive 0, 1, 2, 3
for the
Color Computer
Starting at \$199.95



Disk Drive Upgrade
for Model III/IV easy to install system
Starting at \$369.95
Call for new lower price

SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701

(617) 872-9090 Telex-383425

Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sat. 10 am to 4:30 pm

DEALER INQUIRIES INVITED.

TERMS:

M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add \$3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA MICRO R.G.S. INC.

751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order.
Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp.

Apple Registered Trademark Apple Computer Corp

IBM-PC Registered IBM Corp.
LDOS Reg. Logical System Inc.

Franklin Registered Trademark Franklin Corp.

Max/80 Registered Trademark Lobo Int.

Dosplus - Micro Systems Software

Newdos/80 - Apparatus Inc.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at ~~\$169.00!~~ CALL FOR
NEW LOW
PRICE

Tandon — Siemens — Remex — MPI — Teac — Shugart — Tabor

Diskette Breakthrough — 10 Pack — ~~\$18.95~~ CALL FOR NEW LOW PRICE

PLEASE CALL FOR OUR MOST CURRENT PRICE REDUCTIONS.

GENERAL AND TECHNICAL

1-800-343-8841

1-617-872-9090

Disk Drives (0123) TRS/80-IBM-Apple-TI-Franklin-Max/80-LNW.....◀

Model I/III/IV Upgrade (Disk Drives - Memory).....◀

Printers—Daisywheel/Dot Matrix..... ▶

Color Computer Printer Interfaces.....▶

Disk Drive Operating Systems.....▶

Repair Services Now Offered—FAST Turn-a-Round. ◀

Apple/Franklin Compatible Add-On Drives with Case & Cable..... ◀

Diskettes 10

DISK DRIVE CASES AND POWER SUPPLIES (5 yr. warranty)

Printer Buffers 8K to 512K..... starting at \$143.95

Holmes Model I/III Speed-up Mod. starting at \$90.00

Cables—Printer/Disk Drive..... starting at \$16.00

Warranty on Disk Drives — 1 Full Year Parts and Labor

SOFTWARE SUPPORT, INC.

One Edgell Road, Framingham, MA 01701

Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sat. 10 am to 4:30 pm

DEALER INQUIRIES INVITED.

TERMS:

M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add \$3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

TRS/80 Registered Trademark Tandy Corp.

IBM-PC Registered IBM Corp.
LDOS Reg. Logical System Inc.

Max/80 Registered Trademark Lobo Inc.

Dosplus - Micro Systems Software

Newdos/80 - Apparat Inc.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

THE PROCEDURE SYSCALL

Microware OS-9 Assembler 2.1 09/05/84 22:32:33
- OS-9 System Symbol Definitions

Page 001

```
00001 *****
00002 * SYSCALL - a powerful subroutine for use with Basic09
00003 * A special thanks to Robert Daggatt for writing this routine.
00004
00005 * Basic09 calling sequence:
00006 * TYPE Register=CC,A,B,DP:BYTE; X,Y,U:INTEGER
00007 * DIM raga:Registera
00008 * RUN SysCall(coda,registera)
00009
00010 * SysCall will allow you to execute ANY OS-9 System call from
00011 * your Basic09 program. BE WARNED!!! SysCall can be VERY
00012 * dangerous, since it permits you to do things you may not want
00013 * done during program execution (like format disks, write
00014 * thousands of bytes all at once, and so on). However, it can
00015 * also be very useful, IF you know what you are doing.
00016
00017 * NOTE: This version of SysCall will cause a Basic09 runtime
00018 * error to occur if your system call returns an error. This can
00019 * be easily overrode, as noted below. If you do this, you
00020 * must check 'raga.CC' to see if a system error has occurred.
00021
00022 * Here is an example of one possible use you may have for SysCall
00023
00024 * PROCEDURE Initialize
00025 * TYPE Register=CC,A,B,DP:BYTE; X,Y,U:INTEGER
00026 * DIM raga:Registera
00027 * DIM path,callcode:BYTE %1% or INTEGER %2%
00028 * OPEN @path,"text":READ
00029 * raga.A:=path
00030 * raga.B:=2 %1% 106atStt code +1
00031 * RUN SysCall(callcode,raga)
00032 * CLOSE @path
00033 * PRINT USING "1111size = %1,2(h4)",raga.X, raga.U
00034
00035
00036
00037
00038
00039
00040
00041
00042
00043
00044
00045
00046
00047
00048
00049
00050
00051
00052
00053
00054
00055
00056
00057
00058
00059
00060
00061
00062
00063
00064
00065
00066
00067
00068
00069
00070
00071
00072
00073
00074
00075
00076
00077
00078
00079
00080
00081
00082
00083
00084
00085
00086
00087
00088
00089
00090
00091
00092
00093
00094
00095
00096
00097
00098
00099
00100
```

```
00457 0034 CC103F ldd #M.DE9 get OS-9 call machine code
00458 0037 3406 pshs D
00459 0039 EE6C ldu Raga+4,S get register raga ptr
00460 003B EC41 ldd R00,U initialize raga for syscall
00461 003D AE44 ldx R01,U
00462 003F 10AE46 ldy R0Y,U
00463 0042 EE48 ldu R0U,U
00464 0044 ADE4 jar #,S execute syscall
00465 0046 3441 pshs CC,U save CC,U
00466 004B EE6F ldu Raga+7,S
00467 004A 3348 laau R0U,U
00468 004C 363E pshu A,B,DP,X,Y return updated regs to caller
00469 004E 3512 puls A,X get CC,U
00470 0050 A7C2 ata ,-U
00471 0052 AF48 ata R0U,U
00472 0054 3264 laaa 4,S discard OS-9 call subroutine
00473
00474 * If you want to eliminate the possibility of a runtime error
00475 * remove the comment designator !%1 from the next line.
00476
00477 * clrb
00478 0056 39 rts
00479 0057 53 ParamErr coob return carry set
00480 005B C638 ldb #CCParam Parameter Error
00481 005A 39 rts
00482
00483 005B 8931F4 aood
00484 005E SysCallEnd equ *
```

```
00000 error!
00000 warning!
00000 program bytes generated
00000 data bytes allocated
00000 04102 bytes used for symbols
```

THE BASIC09 PIPE PROCEDURES

PROCEDURE OutPipe

```
0000
0001 (* Demonstration of how you can create an output pipe
0002
0003
0004
0005
0006
0007
0008
0009
0010
0011
0012
0013
0014
0015
0016
0017
0018
0019
0020
0021
0022
0023
0024
0025
0026
0027
0028
0029
0030
0031
0032
0033
0034
0035
0036
0037
0038
0039
0040
0041
0042
0043
0044
0045
0046
0047
0048
0049
0050
0051
0052
0053
0054
0055
0056
0057
0058
0059
0060
0061
0062
0063
0064
0065
0066
0067
0068
0069
0070
0071
0072
0073
0074
0075
0076
0077
0078
0079
0080
0081
0082
0083
0084
0085
0086
0087
0088
0089
0090
0091
0092
0093
0094
0095
0096
0097
0098
0099
0100
```

PROCEDURE InPipe

```
0000
0001 (* Demonstration of how you can create an input pipe
0002
0003
0004
0005
0006
0007
0008
0009
0010
0011
0012
0013
0014
0015
0016
0017
0018
0019
0020
0021
0022
0023
0024
0025
0026
0027
0028
0029
0030
0031
0032
0033
0034
0035
0036
0037
0038
0039
0040
0041
0042
0043
0044
0045
0046
0047
0048
0049
0050
0051
0052
0053
0054
0055
0056
0057
0058
0059
0060
0061
0062
0063
0064
0065
0066
0067
0068
0069
0070
0071
0072
0073
0074
0075
0076
0077
0078
0079
0080
0081
0082
0083
0084
0085
0086
0087
0088
0089
0090
0091
0092
0093
0094
0095
0096
0097
0098
0099
0100
```

PROCEDURE POpen

```
0000
0001 (* This is how you can create a pipe to or from a specific program.
0002 (* NOTE: This procedure assumes that you have paths 0, 1 and 2 open.
0003 (* A special thank you to Robert Daggatt for writing this program.
0004
0005
0006
0007
0008
0009
0010
0011
0012
0013
0014
0015
0016
0017
0018
0019
0020
0021
0022
0023
0024
0025
0026
0027
0028
0029
0030
0031
0032
0033
0034
0035
0036
0037
0038
0039
0040
0041
0042
0043
0044
0045
0046
0047
0048
0049
0050
0051
0052
0053
0054
0055
0056
0057
0058
0059
0060
0061
0062
0063
0064
0065
0066
0067
0068
0069
0070
0071
0072
0073
0074
0075
0076
0077
0078
0079
0080
0081
0082
0083
0084
0085
0086
0087
0088
0089
0090
0091
0092
0093
0094
0095
0096
0097
0098
0099
0100
```

Microware OS-9 Assembler 2.1 09/05/84 22:32:50
- Error Code Definitions

Page 002

```
00446 0025 ECF04 ldd 1Function,EI get OS-9 function code
00447 002B AE66 ldx Function+2,E get size of function param
00448 002A 301F laax -,X INIEBER?
00449 002C 2629 bna ParamErr abort if not
00450 002E 1F9B tlr B,A
00451
00452 * Now you build your OS9 call and return from subroutine on
00453 * attack (A)=OS9 function call
00454
00455
00456
00457
00458
00459
00460
00461
00462
00463
00464
00465
00466
00467
00468
00469
00470
00471
00472
00473
00474
00475
00476
00477
00478
00479
00480
00481
00482
00483
00484
00485
00486
00487
00488
00489
00490
00491
00492
00493
00494
00495
00496
00497
00498
00499
00500
```



```

014C   DIM Regs:Registers
0155   DIM Program,Parameter:STRING(99)
0165   DIM SavePath,BysDup,SysFork:BYTE
0174
0175   SysFork:=003 \/* OS-9 F0SysFork system cal
0179   SysDup:=002 \/* OS-9 I0SysDup system cal
018C
0190   CREATE @Pipe,"/pipe":UPDATE
01C0   Regs.A:=StdPath
01D9   RUN SysCall(1SysDup,Regs) \/* save std path
01F8   SavePath:=Regs.A
0203   CLOSE @StdPath
0209   Regs.A:=Pipe

```

```

0215   RUN SysCall(1SysDup,Regs) \/* asks std path the pipe
0230   Program:=Module:CHR(190)
024A   Parameter:=Parameter:CHR(190)
0257   Regs.A:=0
0262   Regs.B:=0
0260   Regs.X:=ADDR(Program)
0278   Regs.Y:=LEN(Parameter)
0289   Regs.U:=ADDR(Parameter)
0296   RUN SysCall(1SysFork,Regs) \/* fork pipeline process
02B0   CLOSE @StdPath
02C3   Regs.A:=SavePath
02CF   RUN SysCall(1SysDup,Regs) \/* restore std path
02F1   CLOSE @SavePath

```

User Group News

The OS-9 Users Group now has a Color Computer Club Coordinator. He is James Jones, 413 West Eufaula, Norman, OK 73069, a member of this SIG.

James will be working closely with the membership committee and hopes to furnish all Color Computer Clubs with a list of OS-9 Users Group members in each club soon. After this initial contact, he'll be encouraging them to form local OS-9 groups within their clubs. He will be working on the logistics of getting these new members active in the National Group, getting software exchange disks to the clubs, etc. If you would like to help, or if your club is interested, feel free to contact James directly.

Bill Turner, 3316 San Luis St., Tampa, FL 33629 has promised to serve as Information Coordinator for the OS-9 Users Group. Ray Patterson, Mountain View, Ariz., and Hal Brown, Huber Heights, Ohio, have volunteered to serve as members of this committee.

The group will gather a comprehensive list of citations of articles about the OS-9 operating sys-

tem. This list will be published in MOTD, on the CompuServe OS-9 SIG and in other publications. This will be a real asset for people studying OS-9 techniques.

At the OS-9 Users Group meeting in Des Moines, we formed a resolution committee to deal with any present problems and future wishes regarding OS-9. We hope that the committee will serve both our members and the vendors of OS-9 software by cutting down the number of people hassling the vendors. Bill Turner, 3316 San Luis St., Tampa, FL 33629 is Chairman of the Committee. Members include Alan Clute of Sunnyvale, Calif.; Rick Beckenbauer of Norman, Okla.; Steve Blasingame and James Jones, Oklahoma City, Okla.; Philip Lueda, Sharpsville, Penn.; Dave Kaleita of Troy, Mich. and Bill Bolling of St. Louis, Mo.

On Helping Each Other

When you're getting together for your next Color Computer Club meeting, give some thought to a guest speaker. The speaker doesn't have to be someone

who knows everything — just someone who knows about a specific field.

I spoke at the Northern Virginia Color Computer Club (NVCCC) September 1, and really enjoyed the chance to sit in. You too could be a guest speaker. For example, one NVCCC member recently gave a talk on disk drives and disk controllers. The guy didn't know everything there was to know, but he certainly gave out more information than a lot of members had available to them.

That's it for November. Enjoy Sys-Call and the BASIC09 pipe routines. Join us in December when we'll try to get this column back on track with several filter listings written in both assembly language and C. Happy Thanksgiving!



WE'VE GOT WHAT IT TAKES...

To make your CoCo "JUST LIKE THE BIG GUYS!"

RENSSELAER, NY

"...with WORD-PAK, and a few operating modifications, the CoCo rivals the best computers on the market..."
 "...After using WORD-PAK only a few days, I can't imagine running the CoCo without it..."

Frank B.

LYNCHBURG, VA

"...the WORD-PAK is one of the great breakthroughs for the CoCo, right up there with 64K..."

Lane L.

DALE CITY, VA

"...Feel free to use my letter as a testimonial, because your product is one of the most valuable peripherals available for the Color Computer..."

William B.

WAUKESHA, WI

"...This is the second best add-on to the CoCo only next to disk drives! Thank you gentlemen for bringing this device to the CoCo community..."

Dennis W.

RIALTO, CA

"...To put it mildly, I LOVE IT... You are to be congratulated on building the most needed peripheral for the CoCo... I am also going to send off letters to both the Rainbow and Color Computer News..."

Darryl H.

JACKSONVILLE, FL

"...I am very impressed with the performance and quality of the WORD-PAK. It looks GREAT!!!"

Milt W.

SPARTANBURG, SC

"...The WORD-PAK is terrific and I'm changing all my basic programs to work with it. Keep up the terrific work..."

Dennis S.

Call or write today for **FREE** catalog ... **PBJ, INC.** • P.O. Box 813 • N. Bergen, N.J. 07047 • (201) 330-1898

THESE FINE STORES CARRY THE RAINBOW

The retail stores listed below carry THE RAINBOW on a regular basis and may have other products of interest to Color Computer users. We suggest you patronize those in your area.

ALABAMA Birmingham Florence Huntsville Madison Montgomery	Jefferson News Co. Anderson News Co. Endicott Software Madison Books Trade 'N' Books	Kissimmee Longwood Melbourne	Radio Shack & Elec. Hut Adventure International Store City Newsstand The Little Store Mira Byte The News Rack Software City The Alamo Software Unlimited Computer Systems Group Boyd-Ebert Corp. Anderson News Co. Family Computers	Peoria	Book Emporium Shendon Village Westlake Shopping Center Book Market Illinois News Service Kroch's & Brentano's Kroch's & Brentano's Book Emporium Sangamon Center North Town & Country Shopping Ctr. Book Emporium Paper Place North Shore Distributors
ALASKA Fairbanks	Electronic World	Miami Orange Park Orlando	Paging Place Caribbean Engineering Corp. Anderson News Co. Fine Print Bookstore Software City Software Store Sound Trader & Computer Center	Schaumburg Skokie Springfield	White Cottage Electronics Finn News Agency, Inc. The Computer Experience Bookland, Inc. Indiana News Computer Store Elek Mart
ARIZONA Glendale Mesa Phoenix	Road Runner Computer Products Personal Computer Place Home Brew Computers The Computer Shop In-Tech Computers Data Concepts SoftwareLand Corp. All Systems Go Books Etc. Computer Library Anderson News Co. Minz Electronics Soft Shop	Panama City Pensacola Sarasota South Pasadena Stuart Tallahassee Tampa	Chips, Inc. Gulf News Agency Software City Software City Muscookee News Co. Software City Kent Radio Shack Kannon Music Radio Shack Act One Video	Sunnyland West Frankfort Wheeling	Bauer Electronics Arcs Office Supplies Computer Corner Radio Shack Advanced Color Software Radio Shack at Scottsburg Mittling's Electronics
Scottsdale				INDIANA	
Tempe				Berne Garrett Greenwood Indianapolis	
Tucson				Jasper	
Yuma				Lawrenceburg Madison Marion Martinsville New Haven Scottsburg Walbach	
ARKANSAS Little Rock	Anderson News Co.	GEORGIA Atlanta		IOWA	
CALIFORNIA				Bettendorf Davenport	Cosmos Computers Interstate Book Store Software City
Citrus Heights Downey El Cajon Edin Folsom Fortuna Glenn Half Moon Bay Hesperia Hollywood Livermore Lompoc Los Angeles Milpitas Modesto National City	Software Plus The Floppy Disk Radio Shack Software City Computers, Etc. R&V Sound The Computer Supply Store Strawflower Electronics Dessert Sound, Inc. Levity Distributors Software Galena L&H Electronics Emporium Polygon Co. AVS Computer Systems Software Mart JARB Software Witty's Electronics Pro Am Electronics Printers, Inc. Tower Magazine Computer Dimension The Computer Store Cast Plus Software Dimensional Software Disney's Electronics Radio Shack News On 24 Sawyer's News, Inc. Software 1st Color Computing Hardings Way News Computer Literacy	Augusta Columbus	Radio Shack Martin Music Radio Shack	KANSAS Junction City Topeka	Ill. H's Stereo Palmer News, Inc. Town Crier of Topeka, Inc. Amateur Radio Equipment Co. Lloyd's Radio
Pacific Beach Palo Alto Sacramento San Diego		Cumming Jesup		Wichita	
San Francisco Santa Rosa		Marietta St. Simons Island Tallahassee	F/M Systems Electronics Magnum Computer Products Johnson News Agency	KENTUCKY	
Southgate Stockton Sunnyvale		IDAHO Blackfoot Boise		Hopkinsville Louisville	Hobby Shop The Computer Store Radio Shack Radio Shack Gus-Stan Enterprises Gus-Stan Enterprises
COLORADO		Moscow LUNOIS Aurora Champaign Chicago	Kroch's & Brentano's Book Market B. Dalton Booksellers N. Walbach St. West Jackson St. Bob's in NewTown Bob's News Emporium Bob's Ringers Park Book Market East Cedar North Cicero West Diversy E.B. Garcia & Associates Gulf Books & Periodicals Kroch's & Brentano's South Walbach West Jackson 516 N. Michigan 835 N. Michigan Parkway Drugs Parkwest Books Sandmeyer's Bookstore Univ. of Chicago Bookstore Univ. of Illinois Bookstore Videomart, Inc. Book Emporium Book Market Book Emporium K-Mart Plaza Northgate Mall AppleTree Computers Book Emporium Chicago-Main News B & J Supply Book Emporium Book Nook Bill's TV Radio Shack Kroch's & Brentano's B.T.E.S. Systems Kroch's & Brentano's Book Emporium	Louisville Mayville Paducah Paintsville Pikeville	
COLORADO				LOUISIANA Baton Rouge	
Aurora	Aurora Newsland			Crowley Shreveport Slidell	Acme Book Co. Software Solutions Acadiana Newsstand Computer SOS Radio Shack 7181
Colorado				MAINE	
Springs	Hathaway's Magazines Software City			Brookton E. Wilton Lewiston South Portland Waterboro	Voyager Bookstore Orblan's Electronic Svc. Ctr. Computer Software & Education Centers Portland News Co. Radio Shack
Westminster				MARYLAND	
CONNECTICUT				Baltimore Kensington Lexington Park	The Program Store The Program Store Books, Etc. Bowes Books
Danbury Monroe Orange	Computer Serv. of Danbury Mackey's Software City			MASSACHUSETTS Brookton Cambridge	Voyager Bookstore Nin's Corner, Inc. Out Of Town News The Program Store Microcan Computer & Software Store Program Store Corners Book Shop Isawich News Computer Plus North Shore News Co. Microcan Softwarecenters
DELAWARE		Chillicothe Danville Decatur		Danvers Farmington Fitchburg Ipswich Littleton Lynn Woburn	
Wilmington	Norman, Inc.—The Smoke Shop The Program Store			MICHIGAN	
DISTRICT OF COLUMBIA				Allen Park Ann Arbor Brooklyn Charlotte Dearborn Durand Fenton	Book Nook, Inc. Community News Center Weatherwax Radio Shack Computer Options DSL Computer Products Robbins Electronics Tri-County Electronics Radio Shack
FLORIDA					
Boca Raton Clearwater	Software, Software, Inc. The Avid Reader Soenen & Wilmoth Books Software City Village Book Shop Data Base Software Plus More Mike's Electronics Distributor Software Connection The Book Nook Book Town	DeKalb East Moline Evanston Geneseo Keweenaw Lisle Newson Oak Brook Oak Park			
Cocoa Cocoanut Creek Davie Ft. Lauderdale					
Jacksonville		Paris			

<p> FLINT Greenville Kalamazoo Lapeer LOWELL MI Clemens MI Moms Muskegon Novi Okemos Owosso Perry Pontiac Roseville Royal Oak St. Johns Southfield Sterling Heights Wyoming MINNESOTA Minneapolis MISSISSIPPI Grenada Gulfport MISSOURI Kansas City St. Louis University City NEBRASKA Lincoln Omaha NEVADA Las Vegas NEW HAMPSHIRE Peterborough Portsmouth West Lebanon NEW JERSEY Bergenfield Cedar Knolls Cherry Hill Clinton Eatonstown Lawrenceville Linwood Marmora Montvale Morristown Pennsville River Edge Rockaway Summit Teaneck Wayne NEW MEXICO Albuquerque Las Alamos NEW YORK Brooklyn East Syracuse Emilia Heights Fairport Hudson Falls Johnson City Mt. Kisco New York N. White Plains Pittsford Rochester Spring Valley Syracuse Woodhaven </p>	<p> "I O" Robbins Electronics John Rollins Computer Corner User Friendly Curt's Sound & Home Arcade Center Key Book Shop Michigan Radio Shop And Save The Eight Bill Corner MI Software Dist., Inc. Software City C/C Computer Systems Hi-Fi Audio Co. Perry Computers Perry Oil & Gas Computer Shack New Horizons Software City Clinton Electronics Software City Sterling Book Center Gerry's Book Co. Read-More News Stereo Store of Grenada, Inc. Computerland Midwest CoCo Systems Book Emporium Magic World Software Centre Computer Exchange Final Edition Hobby Town Computers & Components Hurley Electronics Software City Radio Shack Portsmouth Computers Verham News Corp. Software City Village Computer & Software Software City Micro World II The Program Store Micro Con Software Center Software City Outpost Radio Shack Software City Software City Dave's Elec., Radio Shack Software City Software Station Software City Software City Wayne Software East West Enterprises Page One Newsstand Salt of the Earth Sound Center — Radio Shack Lift Bridge Book Shop, Inc. The Data/Phile Co. Southern Tier News Co., Inc. Software City G.A. West & Co. Unicom Electronics Software City Barnes & Noble — Sales Annex Coliseum Books Eastern Newsstand Grand Central Station, Track 37 200 Park Ave., (Pan Am #1) 55 Water Street World Trade Center #2 First Stop News Idle Hours Bookstore International Smoke Shop Jahit Smoke Penn Book State News Usercom Systems, Inc. Walden Books World Wide Media Services Software City Adirondack Computer Supplies Village Green World Wide News Software City Programs Plus Spectrum Projects </p>	<p> NORTH CAROLINA Aberdeen Charlotte Havlock Hickory Marion Raleigh Winston-Salem NORTH DAKOTA Fargo OHIO Canton Cincinnati Columbus Coshooton Dayton Fairborn Kent Kenon Lakewood Lima Mayfield Heights Miami Rocky River Toledo Westerville Youngstown OKLAHOMA Hobart Oklahoma City OREGON Albino Hermiston Medford Portland PENNSYLVANIA Allison Park Allentown Greensburg Harrisburg Huntingdon Valley Malvern Philadelphia Phoenixville Pittsburgh Pleasant Hills Plymouth Meeling Pottstown Scranton Shippensburg Tunkhannock Whitehall Williamsport York RHODE ISLAND Newport Warwick SOUTH CAROLINA Charleston Hts. Beaufort Greenville Hilton Head Spartanburg Union TENNESSEE Chattanooga Dickson Knoxville Memphis Nashville Smyrna TEXAS Austin Beeville Corrino Elgin Fl. Worth Houston Irving Orange Paris King Electronics Radio Shack Software City Newsstand Int'l Papers & Paperback Computer Concerns C? Books & Comics Boomers Rhythm Center D.J.'s Book and News Softmart K & S News Stand Computer Associates Little Professor Book Center Cinsoft The Program Store Utopia Software Wilke News News-Readers The News Shop T.W. Hagon & Associates Lakewood International News Brunel News Agency Edu-Caterers Programs Unlimited Software City Wilke News Programs Unlimited Leo's Book & Wine Shop Reitz Electronics Home Computer Store Software City Shortgrass Electronics Mail Micro Software 8. Color Computer and Software Lee's TV & Radio Clinic John's News Stand 80-Plus </p>	<p> UTAH Murray Ogden VIRGINIA Alexandria Falls Church Gaithersburg Narfolk Richmond WASHINGTON Bellevue Marysville Mount Lake Tacoma Renton Seattle Tacoma WEST VIRGINIA Lesage Logan Parkersburg WISCONSIN Appleton Cudahy Janesville Ladysmith Milwaukee Deseret Book Computer City Alonso Book & Periodical The Program Store Electronics Marketing I-O Computers Software City Software City More Than Games Emerald Computer Services Data Borne Adams News Co., Inc. Nybbles 'N' Bytes Pioneer Technology Stan's Electronics & Radio Shack Valley News Service Badger Periodicals Cudahy News & Hobby Book World Electronics, Etc Abacus Micro Book Tree Booked Solid Booked Solid II Harvey Schwartz Bookshop Univ. of Wisconsin Bookshop The Computer Store Paris Radio Electronics MacLeans Ltd Barthead Sound 1982 Ltd. Double "D" A.S.C. Radio Shack Imperial Computer Ltd. Radio Shack Associated Stores Radio Shack Associated Stores Coastal Sight & Sound Langford Electronics CMD Micro Kelly Software Distributors Radio Shack D.N.R. Furniture & TV Fox City Color & Souha Radio Shack The Stereo Hut The Book Nook Northern Computer Service Technics TV Ltd. Radio Shack Associated Stores Radio Shack Associated Stores Radio Shack Associated Stores Phantom & Son's Computerworld Tele-Logic Pynewood Sight & Sound Don's Radio Shop Photocraft Vermilion Ltd Radio Shack Compulit Ken Dawson Microwest Distributors International Software J & J Electronics Ltd. Sector Software Atlantic News Bowmanville Audio-Vision LTD NEPCOM Galls Book World CMUG T.M. Computers Multi-Mag National News Co., Ltd Messageries de Presse Benjamin Enr Sec. De Loc George Glass Computerline Big Byte Computer Services H & H Electronics Software City </p>
--	---	---	---

Also available at all Waldenbooks, Coles and selected B. Dalton Bookseller stores in the United States and Canada.

ADVERTISER'S INDEX

We encourage you to patronize our advertisers — all of whom support the TRS-80 Color and TDP System-100 computers. We will appreciate your mentioning THE RAINBOW when you contact these firms.

AAA Chicago Computer Center	273	Dorison House Publishers Inc.	7	Owl-Ware	196
Alban Scientific	70	Dorsett	265	Parsons Software	233
Ankia Research	16	Double Density Software	170, 171	PBJ, Inc.	79, 285
Ark Royal Games	239	Dragon User	118	Perry Computers	119
Armadillo International Software	220	DSL Computer Products	275	Petrocci Freelance Associates	32
Aurora Software	200	DSS Peripherals Corporation	22	Pinto	235
B & B Software	222	Dugger's Growing Systems	215	Polygon Co.	134
B5 Software	95	E.D.C. Industries	221	Dr. Preble's Programs	172
Basic Technology	111	EAP Co.	205	Prickly-Pear Software	133
Betasoft Systems	10	Eclectic Systems Corporation	70	PXE Computing	77
Big B Software	208	Elite Software	38, 39	R.G.S. Micro Inc.	101, 103
Botek Instruments	207	Endicott Software	197	Radio Shack	82, 83
Butterfly Software	248	Federal Hill Software	253, 255	Rainbow Gift Certificate	71
Calc-Soft	234	Garland Software	173	Rainbow On Tape	248
Cancoco	175	GIMIX	290	RAINBOWtest	26
Cer-Comp	159	Grafax	40	Reitz Electronics	213
Challenger Software	135	Great Plains Computer Co., Inc.	274	REM Industries	233
Cinsott	78	Green Mountain Micro	231	Robotic MicroSystems	226
Classical Computing	248	Hard Drive Specialist	149	Saguaro Software	266
CMD	184	Hawkes Research Services	183	Selected Software	80
CNR Engineering	31	HJL div. of Touchstone Technology, Inc.	11	Skyline Marketing	53, 55
CoCo Warehouse	24	Frank Hogg Laboratory	IBC	Soft Shop, The	240
Cognitec	13	Howard Medical	34	SOFTECH	131
Cognitive Development	242	Incentive Software	230	Softlaw Corp.	41, 42, 43
Color Connection Software	169	Intracolor	122	Softmart	14
Color Micro Journal	144	J & M Systems	260	Software Connection	241
Color Power Unlimited, Inc.	9	JARB Software	97, 161	The Software House	113
Color Software Services	150	The JBM Group Inc.	107	Software Plus	20
Colorware	25, 26, 27	D.P. Johnson	219	Software Support, Inc. ...	282, 283
Compugenesis	21	Kelly Software Distributors	227	Solid Software	235
Computer Accessories of Arizona	206	Key Color Software	251	Sonburst Software	226
Computer Associates	48	KRT Software	174	Southwestern Digital	115
The Computer Center	209	LP Seymour SVS	160	Spectral Associates	BC
Computer Island	124, 125	Mark Data Products	88, 202, 203	Spectrum Projects	137, 138, 139, 141, 142, 143, 145
Computer Plus	3	Metric Industries	201	Speech Systems	57, 58, 59
Computer Systems Center	105, 211	MichTron	33, 35	Sugar Software	224, 278, 279
Computize, Inc.	289	Micro Magic	263	T & D Software	185
Computize, Inc.	93	The Micro Works	46	Tandar Software	114
Cosmos Computer Services Inc.	123	Microcom Software	8	TCE Programs, Inc.	194
Creative Technical	219	Microtech Consultants Inc.	15	Tri-Tech Electronics	237
Custom Computer Products	102	Microware Systems Corporation	276	Trlad Pictures	62
Custom Software Engineering	129	Tom Mix Software	IFC, 73, 74, 75	True Data Products	258
The Data'Phile	112	Moreton Bay	30	Vidtron	49
Data-Comp	257	Oelrich Publications	236	Wasatchware	249
Datafact Software LTD	160	The Other Guys Software	204	West Bay	232
Dataman International	217	Owls Nest Software	210	Wish Software	256
Dayton Associates of W. R. Hall, Inc.	192			Woodstown Electronics	65
Deft Systems	17			Workbase Data Systems	168
Delker Electronics	61			YGS	131
Derringer Software	87, 98			York 10	108, 109
				Zoso Software	242

Exclusively ...

GRAPHICOM II

HOW DO YOU MAKE A GREAT PROGRAM
LIKE GRAPHICOM EVEN GREATER???

THE LEGACY CONTINUES.....

- * ROTATE GRAPHIC IMAGE ABOUT ANY Z AXIS
- * SLIDE - POSITION GRAPHIC WITH WRAP-AROUND
- * COPY/ENLARGE WITH USER-DEFINED SHAPES
- * PAN AND ZOOM - "BLOW-UP" OR "ZOOM IN" ON IMAGE
- * FONT EDITOR - CREATE FONT STYLES OR CHAR. SETS
- * SPECIAL EFFECTS - TUNNEL VISION, FISHEYE, ETC.
- * PIXEL BLASTER - WIDEN LINES COLOR SEPERATIONS

(C) 1984 WHITESMITH

=> FEATURES <==

INTRODUCTORY PRICE **\$24.95** SUPPLIED ON DISK



SPECIAL PACKAGE !!!

GRAPHICOM
+
GCU
+
GRAPHICOM II
(A \$70.00 VALUE)

☆☆☆☆☆☆
☆**\$49.95**☆
☆☆☆☆☆☆

(DIGITIZED CARTOON FROM MAGAZINE)

GRAPHICOM / VIDEO DIGITIZER

- * INPUTS DIRECTLY INTO GRAPHICOM FOR E-A-S-Y ENHANCEMENTS, STORAGE, MANIPULATION, TITLES, STAMPING AND STORAGE. CATALOG ON DISK YOUR FAVORITE "VIDEO PHOTOS" OF YOUR FRIENDS, FAMILY, MOVIE AND TV CHARACTERS, ETC.
 - * ACCEPTS COMPOSITE VIDEO SIGNAL FROM VIDEO CAMERA, VCR OR OTHER COMPATABLE SOURCES.
 - * VIEW "OFF-AIR" OR "VTR" DIGITIZED VIDEO AT CLOSE TO REAL TIME. "SNAPSHOT" VIDEO FRAME TO THE DIGITIZER'S INTERNAL MEMORY. NO SLOW, "MESSY" SERIAL PORT MANIPULATIONS... JUST HIT YOUR JOYSTICK'S FIRE BUTTON! IT'S THAT SIMPLE.
 - * USE WITH YOUR MULTI-PAN OR A "Y" CABLE (AVAILABLE AT \$19.95)
 - * VIDEO INPUT IS VIA "BNC" TYPE CONNECTOR. EXTERNAL CONTROLS FOR: HORIZ. POSITION, VERT. POSITION, HORIZ. WIDTH, AND CONTRAST (FUZZ) SETTING.
 - * DON'T BE FOOLED BY IMITATORS..THIS IS T-H-E GRAPHICOM VIDEO DIGITIZER.... THE ONLY DIGITIZER THAT "DIRECTLY" INPUTS TO GRAPHICOM. (ORIGINAL DESIGN FROM CHESHIRE CAT - THE FOLKS WHO BROUGHT GRAPHICOM TO THE COCO WORLD)
 - * REQUIRES 64K COCO, DISK DRIVE, AND JOYSTICK
- \$199.95** & \$3.00 S/H
- * FREE GRAPHICOM PROGRAM, PICTURE DISK, AND GRAPHICOM UTILITY SUPPLIED WITH PURCHASE OF VIDEO DIGITIZER. (A \$50.00 VALUE)
 - * CATALOG OF SAMPLE DIGITIZED PICTURES AVAILABLE FREE...CALL OR WRITE.

C 215-948-7280
COMPUTIZE, INC

P.O. BOX 207
LANGHORNE, PA 19047



Check or M.O.

+ \$3.00 SHIPPING

PA Res. add 6% sales tax

**DON'T MISS THE BEST
IN COCO BACKUP UTILITIES —
SEE PAGE 93.**

GIMIX STATE OF THE ART 6809 SYSTEMS FOR THE SERIOUS USER.

For the user who appreciates the need for a bus structured system using STATIC RAM and powered by a ferro resonant constant voltage transformer.

GIMIX has single user systems that can run both FLEX and OS-9 or Multi user systems for use with UniFLEX or OS-9.

GIMIX versions of OS-9 and UniFLEX include maintenance and support by Micro-ware (90 days) and TSC (1 year). Maintenance and support after this period are available at extra cost.

(NOTE: this support and maintenance is only for use with approved GIMIX hardware)

GIMIX has 19MB or high performance 47MB Winchester Drive Systems and/or Floppy Disk Drive Systems.

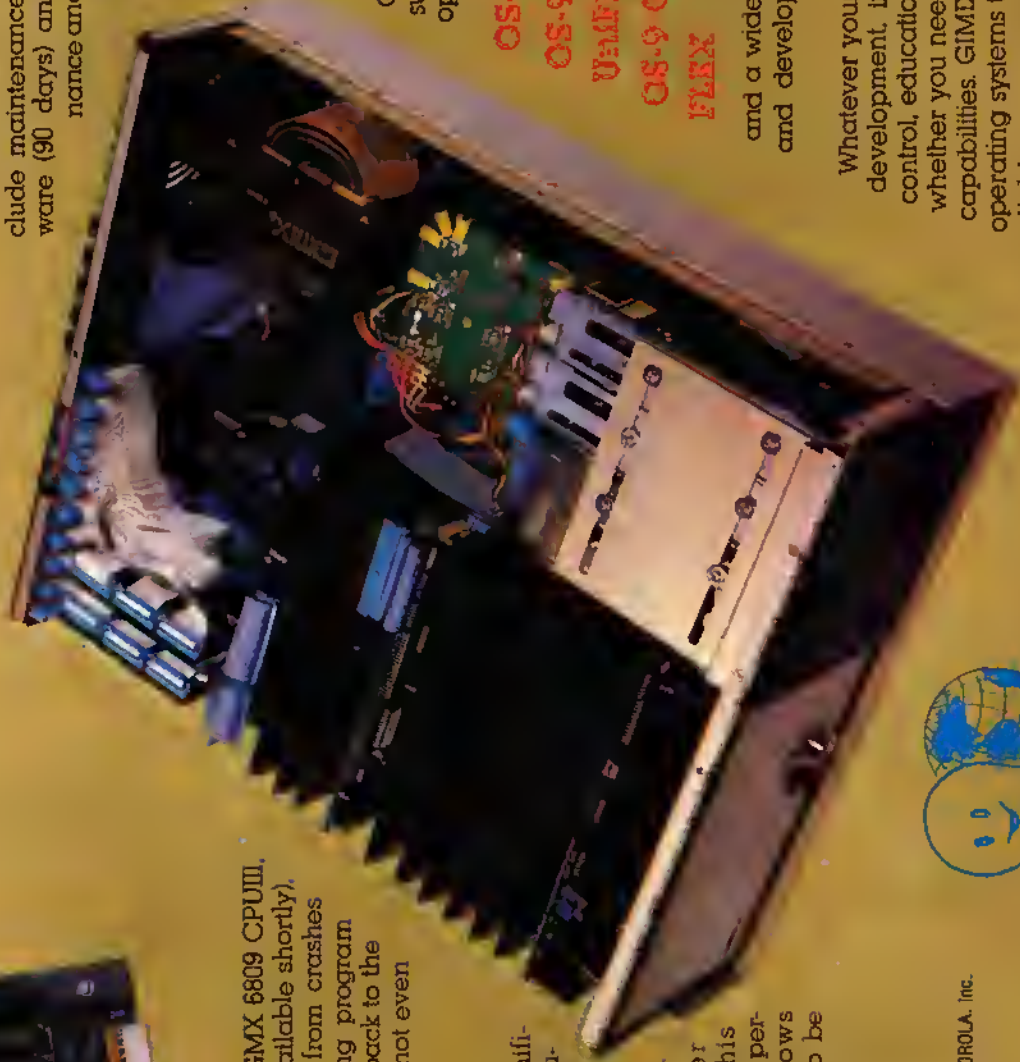


For the ultimate in performance, the Unique GIMIX 6809 CPU, using either OS-9-GIMIX or UniFLEX GIMIX (available shortly), gives protection to the system and other users from crashes caused by defective user programs. e.g. During program development, a programmer who crashes goes back to the shell or the debugger, while the other users are not even aware anything occurred.

The intelligent serial I/O processor boards significantly reduce system overhead by handling routine I/O functions, therefore, by freeing up the host CPU for running user programs. This speeds up system performance and allows multiple terminals to be used at 19.2K baud.



BASIC-OS and OS-9 are trademarks of Microware Systems Corp. and MOTOROLA, Inc. FLEX and UniFLEX are trademarks of Technical Systems Consultants, Inc. GIMIX, GHOST, GIMIX, CLASSY CHASSIS, are trademarks of GIMIX, Inc.



GIMIX 6809 systems support five predominant operating systems:

**OS-9 GIMIX III,
OS-9 GIMIX II,
UniFLEX,
OS-9 GIMIX I,
FLEX**

and a wide variety of languages and development software.

Whatever your application: software development, instrumentation, process control, educational, scientific or business: whether you need single or multi-user capabilities. GIMIX has hardware and the operating systems to get the job done reliably

Please phone or write if you need further information.



GIMIX inc.

1337 WEST 37th PLACE • CHICAGO, ILLINOIS 60609 • (312) 927-5510 • TWX 910-221-4055

© 1983 GIMIX Inc.

O-Pak

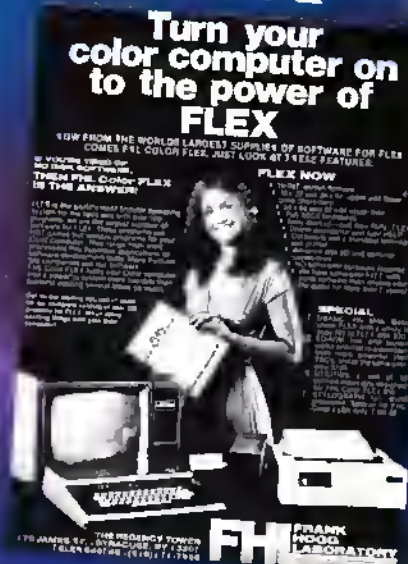
The world's largest manufacturer of software presents...



Enjoy a Hi-Res screen and the ability to copy files between FHL FLEX, RS OS-9 and Radio Shack DOS with RS OS-9!!
\$34.95

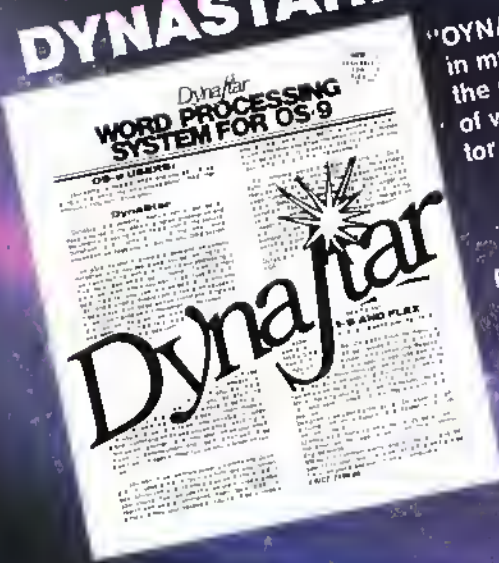
FLEX

NEW LOWER PRICES



Still the best!!
\$49.95
 with DBASIC \$79.95

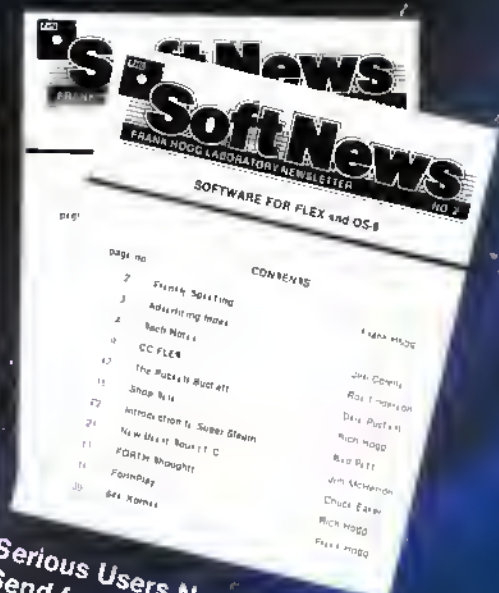
DYNASTAR/DYNAFORM



"DYNASTAR and DYNAFORM, in my opinion, rightly deserve the name 'The Dynamic Duo' of word processing software for the CoCo."
 Dan Downard,
 RAINBOW Magazine,
 July '84

DYNASTAR for RS DS-9
 or CCFLEX **\$49.95**
 DYNAFORM for RS OS-9
 or CCFLEX **\$49.95**
 DYNASTAR/OYNAFORM **\$99.90**

SOFTNEWS



Serious Users Newsletter!
 Send for Free Sample Copy.

FHI FRANK HOGG LABORATORY

THE REGENCY TOWER • SUITE 215 • 770 JAMES ST. • SYRACUSE, NY 13203
 PHONE (315) 474-7856 • TELEX 646740

GUARANTEED QUALITY

SPECTRAL ASSOCIATES HAS PRODUCED THE HIGHEST QUALITY COLOR COMPUTER ARCADE GAMES FOR MORE THAN THREE YEARS. RADIO SHACK HAS LICENSED MANY OF OUR GAMES — HOW MANY OTHER ALLEGED "ARCADE GAME MANUFACTURERS" CAN SAY THAT? SPECTRAL IS THE STANDARD OF EXCELLENCE AND WE STAND BEHIND OUR PRODUCT. IF YOU ARE NOT 100% SATISFIED BY OUR ARCADE GAMES, RETURN THE GAME WITHIN 10 DAYS FOR A FULL REFUND.

DISK DRIVES 320K — \$175*

Amazing, but true. Now you can get 320K bytes of double-sided disk storage for \$175*. Latest technology half-high disk drive which may be configured as two single-sided drives by software or used as a double-sided drive under FLEX. 100% compatible with TRS-DOS and all hardware versions of the Color Computer.

*case and power supply extra

32K/64K UPGRADES

Upgrade your Color Computer from 4K/16K to 32K/64K and realize the full potential of your computer. Only the CoCo II upgrade requires soldering. Complete, easy-to-read instructions for all CoCo Versions after the D board.

\$49.95

MACHINE LANGUAGE

So you want to learn the guts of the CoCo, but it costs too much — NOW IT DOESN'T! Look what you get for \$99.95.

- | | |
|-------------------------------------|----------|
| 1. Ultra 80cc Disk Editor-Assembler | \$ 49.95 |
| 2. Bugout Debugging Monitor | 19.95 |
| 3. 6809 Assembly Language (book) | 19.95 |
| 4. The Facts (book) | 14.95 |
| 5. BASIC UNRAVELED (3 books) | 59.95 |

A \$164.75 value for \$99.95 \$164.75

BASIC PROGRAMMING TRICKS REVEALED

Basic programming tricks revealed contains everything you need to know to vastly improve your Basic programming skills. It includes several, never before published, practical examples and explanations of how to use PEEK, POKE, AND, OR, NOT, VARPTR and several other obscure commands. Also included are many useful ways to fool Basic into doing some very powerful things that it normally wouldn't do. Several tricks for Basic, Extended Basic and Disk Basic are all contained in this informative and useful book.

\$14.95

EXPRESS ORDER!

ORDER BY VISA OR MASTERCARD AND YOUR ORDER WILL BE SHIPPED WITHIN ONE BUSINESS DAY — GUARANTEED OR YOU GET THE GAME FREE!! HARDWARE ITEMS SUBJECT TO MANUFACTURERS AVAILABILITY.

WA residents add 7.8% tax

SPECTRAL ASSOCIATES

3418 SOUTH 90th STREET TACOMA, WA 98409

ORDERS ONLY 800 426 1830

ORDER PROCESSING AND INFORMATION 206 581 6938

ARCADE TOP 10

Listed below are the 10 most popular Color Computer games as of SEPT 10.

- | | |
|--------------------|-----------------|
| 1. LANCER | 6. CUBIX |
| 2. CRYSTAL CASTLES | 7. MS. GOBBLER |
| 3. PENGON | 8. BUZZARD BAIT |
| 4. GALAGON | 9. DEVIOUS |
| 5. OIKS | 10. BLOKHEAD |

ARCADE QUALITY GAMES

		Cassette Price
		Disk add \$3.00
LANCER (JOUST)	32K ML	24.95
LUNAR ROVER (MOON PATROL)	32K ML	24.95
GALAGON (GALAGA)	32K ML	24.95
MS. GOBBLER (MS. PAC MAN)	32K ML	24.95
PLANET INVASION (DEFENDER)	ML	24.95
WHIRLYBIRD RUN (SCRAMBLE)	ML	24.95
CUBIX (O'BERT)	32K ML	24.95
GALAX ATTACK (GALAXIANS)	ML	24.95
COLOR PANIC (SPACE PANIC)	32K ML	21.95
COSMIC INVADERS (SPACE INVADERS)	ML	21.95
PENGON (PENG)	ML	24.95
DEVIOUS (XEVIOUS)	32K ML	21.95
FROGGIE (FROGGER)	32K ML	24.95
OIKS (OIK)	32K ML	24.95
STORM ARROWS (TARG)	ML	21.95
ANDROID ATTACK (BERZERK)	ML	24.95
DEFENSE (MISSILE COMMAND)	ML	24.95
GHOST GOBBLER (PAC MAN)	ML	21.95
SPACE RACE (OMEGA RACE)	ML	24.95
CRYSTAL CASTLES (ICE CASTLES)	32K ML	24.95
COLOR ZAP (SPACE ZAP)	ML	14.95
SPACE SENTRY (STAR TREK)	ML	21.95
STAR SPORES (FIGHT ALIEN INVADERS)	32K ML	21.95
BEAM RIDER (ORIGINAL STRATEGY GAME)	ML	24.95
SPACE WAR (INTERPLANETARY COMBAT)	ML	21.95

SPECIAL — Buy 2 get 10% off.

COLOR BASIC UNRAVELED

Color BASIC 1.2/Ext. BASIC 1.1/ Disk BASIC 1.1"

- FULLY COMMENTED • NO HOLES
- ALL FCBS, FDBs and FCCs defined.
- COMPLETE MEMORY MAP • no missing spaces, everything is defined.
- PROGRAMMING TRICKS EXPLAINED
- EASY TO UNDERSTAND
- MOST RECENT ROM VERSIONS

COLOR BASIC UNRAVELED	\$19.95
EXTENDED BASIC UNRAVELED	\$19.95
DISK BASIC UNRAVELED	\$19.95

All 3 for \$49.95

SPECIAL FLEX+ SPECIAL

The premier DOS at an unbelievable price — only \$39.95. Shop around, if you want a version of FLEX which doesn't crash and is fast, get FLEX+. WITH Editor Assembler

NO COD ORDERS

\$59.95

SHIPPING AND HANDLING

ADD 3% , \$2.00 minimum

CANADA ADD 6%, \$3.00 minimum

FOREIGN ADD 15%, \$5.00 minimum

TOLL FREE ORDER LINE